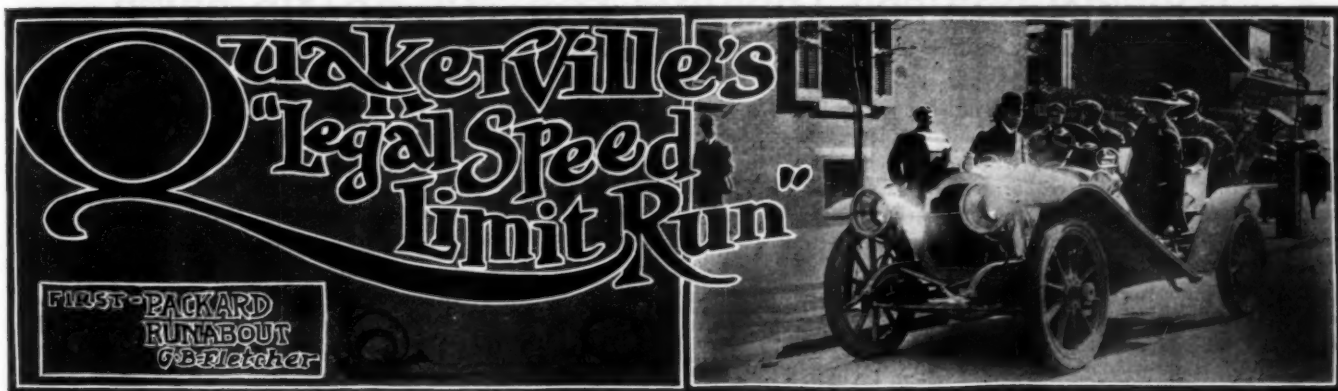


THE AUTOMOBILE



PHILADELPHIA, Nov. 2.—That Eastern automobile classic, the Brazier Cup contest, that in antiquity, if not in importance, exceeds even the Vanderbilt Cup race, was decided on Saturday last over a 65-mile course which gave the contestants a liberal variety of road conditions and an opportunity of exhibiting judgment as to pace. The field was a small one—only nine starters—but the affair was carried out with a minuteness of detail that reflected great credit on the officials. Gustavus B. Fletcher, in a Packard runabout, who won the 1905 contest, repeated on Saturday and was adjudged the winner, his penalties being the lowest—17 min. 30 sec.

The contest committee of the Automobile Club of Philadelphia called the affair a "legal speed limit run," and when it is remembered that the route lay through two score villages, towns, and townships, with a bewildering variety of speed ordinances to recollect and adhere to, it is not to be wondered at that a clean score was a *rara avis*. To assist the contestants, the committee allowed them not only to carry watches and speedometers, but supplied each of them with a speed chart as a partial guide. This chart divided the route into thirteen sections, in each of which the average legal speed limit was set forth. Open country permitted of a 20-mile speed, and but two short sections of the

thirteen allowed of that limit. It was amusing to see each contestant and his assistant, watches and cards in hand, keeping tabs on mileage and speed in an effort to land the cup. That the winner was nearly 18 minutes shy of the actual figures as decided upon by the committee, is an indication that judgment of speed among automobilists generally is not a common commodity.

In arriving at their decisions, the judges used the times recorded by watches at three blind controls, which must have been well secreted, for the press bunch in Wayne Davis' big Matheson could see nary a hide or hair of them, although they kept a sharp lookout. Cars that arrived at these secret controls and at the finish ahead of or behind their allotted times were penalized in minutes and seconds, and the sum total of these derelictions furnished the final scores upon which the decisions were arrived at. A good mathematician was as useful as a judge of speed.

Confetti was scattered at each turn and where speed limits changed, but in many instances the 35-mile northwest gale, which prevailed throughout, blew most of the markers into the next county, and it required veritable Sherlock Holmes work to decry among the dead leaves at the side of the road a telltale bit of the paper which rude Boreas had somehow overlooked. Many strayed from the route in consequence, which probably will ac-



count for any delays in arriving at the controls and finish. Most of the penalties, however, were imposed for early arrival, for whenever a contestant went astray he immediately "beat it" and usually more than made up the delay. An idea of the moderateness of the pace may be had from the fact that the big press car, which started absolutely last and stopped several times en route to allow the benumbed pressmen to thaw out their frozen bearings, reached the head of the line at the 40-mile point. It is to be feared, however, that Pilot Davis, who was at the wheel, and who was untrammelled by schedules, may have ignored in one or two instances the speed ordinances of the villages and townships, despite the fact that almost the entire route lay through the "trap country." Nothing could be seen from the press car.

None but members of the Automobile Club of Philadelphia

were eligible to compete, and owners were drivers in every instance. The following summary will explain matters:

Car.	Owner & Driver.	Start.	Finish.	Penalties.
Packard.....	G. B. Fletcher....	9:10 A.M.	1:02:00 P.M.	17.30
Winton.....	H. P. Bailey.....	9:18 A.M.	1:09:00 P.M.	18.30
Pennsylvania.....	C. Y. Abbott.....	9:14 A.M.	1:08:30 P.M.	22.00
Elmore.....	F. Hardart, Jr....	9:12 A.M.	1:06:00 P.M.	22.00
Bulck.....	Horace Allen.....	9:02 A.M.	1:03:30 P.M.	32.00
Packard.....	E. L. Miller.....	9:00 A.M.	1:02:20 P.M.	52.00
Pope-Hartford.....	John D. Avil.....	9:09 A.M.	1:34:30 P.M.	71.30
Franklin.....	John B. Curtis....	9:08 A.M.	Did not finish.	
Autocar.....	W. S. Harding....	9:06 A.M.	Did not finish.	

This was the sixth contest for the cup, A. H. Chadbourne having won the first, Dec. 5, 1903; C. H. Gillette the second, Oct. 1, 1904; Gustavus B. Fletcher the third, Oct. 7, 1905; George L. Mayer the fourth, Oct. 30, 1906; and Alan Wood, 3d, the fifth, November 2, 1907.

FOREIGN DRIVERS ARRIVING FOR THE GRAND PRIZE

AMERICA seems now to be assured of representation in the Grand Prize race at Savannah on Thanksgiving Day, at least equal to that of Germany and France. At practically the eleventh hour three entries were made that will fill the gap caused by that number of withdrawals and give to the United States a team of five cars. The nomination of the Chadwick that distinguished itself during the middle stages of the Vanderbilt Cup race, with Willie Haupt for its driver, was made almost immediately following the Long Island contest. On Monday, the day set for the closing of the Savannah entries, a Simplex and a National were added to the list.

The Simplex is nominated by Charles A. Singer. It is the same car that won the Brighton Beach 24-hour race on October 2-3, scoring 1,177 miles, a new record. Joseph M. Seymour, who drove a Simplex in the Briarcliff race, is named as its pilot.

The National that has been nominated is a six-cylinder car of 60-horsepower. The National holds the world's 24-hour record for continuous running, having made 1,095 miles on the dirt track at Indianapolis, November 17, 1905. Since then every 24-hour race has had stoppages for "repairing" the track.

The announcement of the withdrawal of the Matheson and Locomotive cars has been made and an official statement issued that the B.L.M. would not start.

"We entered the Vanderbilt race without adequate preparation," said C. W. Matheson, president of the Matheson Automobile Company, "and have no intention of repeating our mistake at Savannah. The factory is too busy getting out our 1909 cars to be able to tinker further with our racing machine. It will, however, be thoroughly prepared and tuned up next Spring and will be a contender in all the big events of the 1909 season."

On Monday, the date set for the closing of the Grand Prize entries, four countries had made entry of teams—America, Germany, France and Italy. The last-named had nominated six cars, the others five each. The A. C. A. contest committee had no further entries in anticipation. The list was as follows:

FRANCE.	
Clement-Bayard.....	Lucien Hautvest
Clement-Bayard.....	Victor Rigal
Lorraine-Dietrich.....	Arthur Duray
Renault.....	Francois Szisz
Renault.....	Lewis Strang

ITALY.	
Fiat.....	Louis Wagner
Fiat.....	Felice Nazarro
Fiat.....	Ralph de Palma
Itala.....	Henri Fournier
Itala.....	Alexander Cagno
Itala.....	Giovanni Piacenza

GERMANY.	
Benz.....	Victor Hemery
Benz.....	Rene Harriot
Benz.....	Fritz Erle
Mercedes.....	Poege
Mercedes.....	Salzer

AMERICA.	
Acme.....	Cyrus Patschke
Lozier.....	Harry Michener
Simplex.....	J. M. Seymour
National.....	Emile Stricker
Chadwick.....	Willie Houpt

Up to Saturday seven of the European drivers had arrived. Alexander Cagno and Giovanni Piacenza, who will drive Italas, came in on the *Koenigen Louise* on Thursday. *La Lorraine*, which arrived on Saturday, brought Felice Nazarro and Louis Wagner, of the Fiat; Lucien Hautvest and Francois Szisz, of the Clement-Bayard, and Arthur Duray, of the Lorraine-Dietrich team. It is expected that before the week closes all of these drivers will be installed at their training quarters on the Savannah course. Of the seven arrivals, four have been winners of classic international races.

An invitation was extended to William K. Vanderbilt, Jr., who has been referee at all the international races in this country, by the A. C. A. contest committee to serve in the same capacity at Savannah. Mr. Vanderbilt declined, pleading poor health and business as an excuse.

Paul LaCroix and Sidney B. Bowman, representing respectively the Renault and Clement-Bayard in this country, sailed for Europe last week, but will return in time for the Savannah races.

The date set for the closing of nominations for the light car race, which will be run on Wednesday, November 25, was Monday. That day 19 entries had been made as follows:

Car.	Cyl.	Bore.	Stroke.	Weight.	Driver.
Maxwell.....	2	4	4	1,100	C. W. Kelsey
Maxwell.....	2	4-1-2	4	1,150	
Maxwell.....	2	5	5	1,700	
Maxwell.....	2	5	5	1,700	
American Aristocrat (2-cycle).....	3	3.65	3.5	1,200	K. R. Manville
Cameron (Air-cooled).....	4	3-3-4	4-1-2	950	F. E. Cameron
Chalmers-Detroit.....	4	3-3-4	4-1-2	1,600	Bergdoll
Chalmers-Detroit.....	4	3-3-4	4-1-2	1,600	Burns
Oldsmobile.....	4	3-3-4	3-3-4	1,700	
Oldsmobile.....	4	3-3-4	3-3-4	1,700	
Oldsmobile.....	4	3-3-4	3-3-4	1,700	
Bulck.....	4	3-3-4	3-3-4	1,560	Easter
Bulck.....	4	3-3-4	3-3-4	1,560	Jeffers
Bulck.....	4	3-3-4	3-3-4	1,560	Hearne
Bulck.....	4	3-3-4	3-3-4	1,560	Burman
Lancia.....	4	3.74	4	1,100	Hilliard
Isotta Fraschini.....	4	2.44	3.50	1,600	Lytle
S. P. O.....	4	3.70	3.70	....	Juhaz
Regolre.....	4	3-2-10	5-2-10	....	Robertson

Among the last cars to arrive for the light car race will be the Lancia and the S. P. O. Signor Lancia was given short notice, but cabled he would be able to get through a car in time.

In addition to the *City of Savannah*, which the Automobile Club of America has chartered outright, the club has reserved all the cabin space in the *City of Columbus*, which will also sail the Saturday before the race. The promoters of special trains on the Seaboard Air Line and the Atlantic Coast Line, which will also serve as hotels during the races, already report large reservations.

A Western Hotel Train for Savannah.

CLEVELAND, Nov. 3.—If present plans are successful, a special train will leave this city for the Savannah races. Plans are being laid to secure at least three Pullman loads, and in case this is successful baggage and dining cars will be added. The party will live in the train the entire six days of the trip. President Bonnell of the local club is in charge of the movement.



Ferries of This Sort Are to Be Seen Frequently Throughout the South.

MANY readers of THE AUTOMOBILE will remember the series of articles which I wrote last Winter describing my tour from New York to Savannah. It will be recalled that the route which I covered at that time was by no means the most direct, but led eastward over the National Highway to Columbus, O., and then southward by way of Cincinnati, Lexington, Louisville, Nashville, Huntsville, and Chattanooga to Atlanta, and thence by way of Macon and Statesboro to Savannah. My idea at that time was not to travel by the shortest route, but by that which offered the most interesting sights and scenes. Furthermore, in a tour which I made two years ago, I traveled via Philadelphia and Gettysburg to Hagerstown, and then down the Shenandoah Valley by way of Winchester and Staunton to Roanoke, Va. It recently occurred to me that, if I could map out a desirable route between Atlanta and Roanoke, I would then be able to supply my fellow tourists with complete data for touring by a direct route between New York and Savannah.

Through the courtesy of Thomas A. Edison, who two years ago spent several weeks in touring through the Carolinas in his two White Steamers, I obtained considerable information regarding the roads in these two States, and, equipped with this data, I last week set out from Atlanta to drive to Roanoke and thus cover the "missing link" between New York City and Savannah.

Georgia roads are bad—unpardonably so—except in those few counties in which the large cities are located. If I may digress for a moment, I would like to point out a recent happening in that State which points toward a rapid improvement of its highways. There had grown up in Georgia what is known as the "convict lease" system, whereby the convicts were leased to "convict brokers" at a nominal sum by the several counties. The brokers, in turn, leased out the convicts to the owners of mines, brick-yards, and lumber-camps, who worked the convicts "to the limit." As a result, a small number of very influential citizens and office-holders benefited greatly by the system, and the convicts were never sent out to work on the roads, except in three or four counties. The abuses of the "convict lease" system became so pronounced that a vigorous campaign against it was started a few months ago by an influential newspaper, the *Atlanta Georgian*. As a result of this campaign, which opened the eyes of the people of the State to the iniquities of the system, the governor convened the legislature in extra session and the "convict lease" system was annihilated by statute.

Therefore, there is now nothing for the convicts to do but to work on the roads. If one county cannot use all of its own convicts on its own roads, it must lend them to any other county which applies for them. Thus it happens that an impetus has been given to the good roads movement in Georgia, the importance of which cannot be overestimated.

The good highways in quantity, however, are yet to be built, and on that drizzly October day when we set out from Atlanta we found it necessary to put the tire chains on the wheels of our White Steamer to prevent skidding off the slippery clay roads. The roads are not all of clay. There are many miles of sandy roads with deep ruts made by the farmers' wagons, all of which travel in one track. This is the time of year when the cotton crop is being marketed, with the result that we met countless teams on the road. In many instances, meeting a team meant that we had to stop and lead the horses or mules by our car, or, perhaps, wait until the driver could turn into some cross-road or "take to the tall timbers." Under such conditions, the progress of the tourist is necessarily rather slow.

Our route led by way of Lawrenceville, Winder, Jefferson, and Royston to Hartwell. Six miles beyond the latter town we crossed Brown's Ferry across the Savannah river into South Carolina. By an ingenious arrangement the current of the river operates the ferry. A cable is stretched from shore to shore, well above the level of the river, and the ferry-boat is connected by two chains to sheaves which run on the cable. By altering the relative length of the two chains, the angle of the ferry-boat to the stream is changed so that the current moves the boat

in either direction which may be desired by the man in charge.

I might say here that in our entire journey from Atlanta to Roanoke, a distance of 490 miles, we had hardly one hundred yards at a time of level country. We were always going either uphill or downhill. In Georgia, the grades are sometimes very steep—dangerously so, it seems, as one guides his car down a winding road with a surface of wet clay and a deep ditch at either side. But as soon as we crossed into South Carolina we noted that the roads had been laid out much more carefully. The road surface was not much better than we found in Georgia, but the gradients were very much less.

Anderson was the first important town we passed through in South Carolina, and next we reached Greenville, a hustling city located 167 miles from Atlanta. As far as Greenville we had been cutting "cross country," in the sense that we



Just a Touch of Southern Color.



Odd Landmark Dividing Winston and Salem.



Convicts Smoothing the Way for a White Steamer.



Typical North Carolina Macadam Road.



In the Tobacco Market at Winston-Salem.

had not followed any line of railroad. At Greenville, we struck the main line of the Southern Railroad, and for the next 150 miles, or as far as Salisbury, N. C., we were seldom very far from the main line of this road.

All the way from Atlanta we had been in a cotton country—in fact, we had seen little else being raised. The farmers' wagons we had seen were all loaded with cotton or with cotton seed—the cotton being taken in bulk to the gins and then in bales to the towns for shipment. Starting about at Greenville, we noted a new phase of the cotton industry, namely, the cotton being made into cloth at the point of production, instead of being shipped to Fall River or to Manchester. We began to realize what is meant by the "New South." It means that in every town along the railroad great cotton mills have been built within the last few years, which compare in size with those of New England and excel them as regards up-to-date equipment. It means that vast electrical power plants have been built to utilize the great natural water powers of the State. The current is used primarily to turn the spindles in the cotton mills, but, incidentally, to bring electrical illumination into almost every home in the towns. It means that beside cotton pickers, the South needs masons and electricians and artisans of every kind, and that it is drawing the enterprising and the ambitious from every section of the country.

On we go, through the cotton fields, past the cotton mills, through Spartansburg and Gafney and Blacksburg, and then we cross the State line into North Carolina near the town of Grover. Next we pass through Bessemer City, Gastonia, and Belmont, and then—*mirabile dictu*—we are on a macadam road! For the first time since we left Atlanta, the hand of our speedometer passed the "30" mark—and keeps going. We slow down again when we meet the chain-gang, busily engaged with stone-crusher and steam-roller building more macadam, leading to the ferry, where another of those "automatic" affairs takes us across the Catawba river. We are back on the macadam, and in a jiffy we have covered eleven miles, which takes us into the center of Charlotte, 284 miles from Atlanta.

How South Carolina Came to Have Roads.

Here we took on as guide, O. L. Barringer, the original good roads man of South Carolina. He told enthusiastically of the progress of the good roads movement in the neighborhood of Charlotte. It seems that some years ago a group of enthusiasts induced the county to build a few miles of macadam road. The farmers along this stretch immediately learned, rather to their own astonishment, that their farm land was worth \$10 an acre more than before. Other farmers heard about this, and they wanted a macadam road built past *their* farms. When a good roads movement progresses so that the farmers become actively interested in the cause, the automobilists need no longer worry very much about the matter. In that section of North Carolina the good roads movement is progressing famously, as we could see for ourselves. We drove from Charlotte to Salisbury, a distance of 46 miles, in a little over two hours. The road was not all of macadam, but where the steam-roller and the chain-gang had not yet done their work, we saw piles of stone at the side of the road, betokening that the good work would shortly be accomplished.

The macadam road lasted for a few miles north of Salisbury, and then we came once more to a section where the roads are as yet left to take care of themselves. Gradually we were getting out of the cotton belt and coming into the tobacco-raising country. The tobacco crop had all been harvested, and the farmers were engaged in taking it to market in their queer boat-shaped wagons, which are characteristic of that section.

Forty miles beyond Salisbury we came to the quaint town of Winston-Salem, famed as a tobacco market. Tobacco wagons by the hundreds lined the streets waiting to discharge their fragrant cargoes at the warehouses. We were told that over half a million pounds of tobacco were brought in by the farmers on the day that we passed through the town. Leaving Winston-Salem, we had a stretch of 12 miles of flawless macadam road

to Kernersville, the last we were to see on our trip. From Kernersville we turned due north and traversed a fair dirt road through Oak Ridge and Stokesdale to Madison. From this point on we had rather poor going.

Thirteen miles north of Madison we crossed the State line into Virginia, and during the rest of our journey the roads were quite as bad as in the State of Georgia. We followed a single-track railroad due north as far as Martinsville. Up to this point we had been traveling on the eastern side of the Blue Ridge mountains, which run practically parallel with the coast. The task which now lay before us was to cross this range into the Shenandoah Valley. The road across the mountains would probably be reasonably good in dry weather, but it was raining when we made the trip, with the result that the going was very heavy and so slippery that we could not make any progress whatever without tire chains. How many times has the thought occurred to me (as it must have to many other tourists) that the makers of accessories have not kept pace with the car makers! On many a long, hard tour my steam car has carried me through without any attention other than filling the oiler, the grease cups, the water tank, and the gasoline tank. But how many times have I stopped to fuss with one accessory or another.



Had the weather been clear, our journey across the mountains would undoubtedly have been the scenic feature of the entire tour, as the foliage of the trees bore a most gorgeous autumnal coloring. As it was, with the rain coming down in torrents and our tire chains giving us constant trouble, it was with a great feeling of relief that we brought our journey to a close in front of the hotel in Roanoke.

In dry weather, a good amply powered touring car should be able to average about 150 miles a day for the entire journey. In rainy weather, I do not believe that there are many tourists who would average more than 75 miles a day south of Roanoke. I would advise those who are planning to drive from New York to Savannah that they start at least two weeks prior to the time of the races, so that they may have ample time if they encounter rainy weather. I would further advise no one to start on his trip without taking at least four sets of tire chains for the rear wheels. As I have indicated above, progress over a wet clay road is practically impossible without tire chains. As regards hotel accommodations, one may fare very well along the route. One must, of course, not expect luxurious accommodations, but he may be quite sure that in any town of any size he need not go to bed hungry, and if one has been driving all day in the



For Miles Only Crop Raised Is Cotton.

open air, the question as to whether the beds are soft or not is entirely academic and not of vital importance.

The accompanying map will show what I regard as the most practical route between New York and Savannah. I have personally driven over every foot of this route, and, therefore, am able to give below exact mileages of the distances between the different towns that dot the course at intervals:



A Cotton Gin at Every Important Crossroad.

New York to Philadelphia.....	108
Philadelphia to Gettysburg.....	120
Gettysburg to Hagerstown.....	34
Hagerstown to Winchester.....	63
Winchester to Staunton.....	93
Staunton to Roanoke.....	88
Roanoke to Winston-Salem.....	121
Winston-Salem to Charlotte.....	85
Charlotte to Anderson.....	148
Anderson to Atlanta.....	136
Atlanta to Macon.....	102
Macon to Savannah.....	186

Total 1,274



Cotton Mills Are Numerous in "New South."

WHAT THE WORLD'S ROADS CONGRESS DEDUCTED

By W. F. BRADLEY.

PARIS, Oct. 20.—Europe's fourteen principal states possess approximately 1,000,000 miles of made road, estimated to be worth \$5,000,000,000, and to have cost in upkeep \$160,000,000. France alone has 500,000 miles of highway fit for fast traffic, exclusive of a mass of roads good for light traffic. With the advent of the railroad the highways of Europe were robbed of their heavy traffic; in France they were well kept, but unused, or at any rate unused for the purpose for which they had been created. Then, instead of means of communication they became playgrounds for the children in the neighborhood of villages, they became an extension of the farmyard, where cattle, fowls and pigs could stray about without fear of being molested.

When the automobile came into existence ten years ago the few hardy sportsmen who traveled round the country on their noisy machines had a perfect set of highways which they shared with nobody. Suddenly the authorities awoke to the fact that the automobile was skimming over these smooth military-made roads, that they were in such numbers that the surface, once perfect, was rapidly being deteriorated, and that France was in serious danger of losing her proud possession of 500,000 miles of sandpapered highways.

Minister of Public Works Barthou looked the facts squarely in the face, recognized that new systems must be adopted for new methods, and decided to call together an international congress uniting representatives of all nations, and experts from all countries. The response was an assembly of 2,500 members, speaking 29 different languages, and officially representing 28 different governments.

For ten days the twenty-five hundred have deliberated on the future of the roads, have studied the exhibition collected from all quarters of the globe, have visited and compared every example of experimental road work within forty miles of Paris, and have made copious notes.

Roads Unsuitable for Fast Mechanical Traction.

It is admitted, as a starting point, that the automobile, more as a result of its speed and its numbers than because of its own special construction, is destroying the roads. To put it more equitably, the roads, as at present constructed, are unsuitable for heavy and fast mechanical traction. L. W. Page, director of the United States office of Public Roads, went into this subject in one of the 102 papers presented, declaring that the damage was done by the tractive force or shear exerted by the driving wheels of motor vehicles.

"At high speeds," he declared, "there is a considerable amount of slip, as is proved by connecting both front and rear wheels with separate speedometers. This slip undoubtedly increases the amount of finely divided material of the road surface thrown into the air. The broken stone road surface has little power to resist a shearing stress, consequently the fine material of which it is composed is carried into the air, subjected to the air currents caused by the body of the car, and subsequently to the wind."

Several other delegates who treated the same subject explained that on paved surfaces the effect of rubber tired wheels was practically nil. The case of the Avenue des Champs Elysées reserved entirely to automobiles, was given as an example of the small amount of damage, the only effect of the rubber tires being to polish the wood blocks smoother. Granite or other hard



Why Autoists Are Numerous In France.

stone pavement, if laid on a solid foundation, hardly suffered at all from automobile traffic. The binder between granite blocks might be sucked out by the action of the pneumatic tires, but this could easily be remedied by the use of more suitable material. Chains and all anti-skid devices came in for criticism as road destroyers on powerful cars driven at high speeds, one English road builder going to the extent of proposing fine or imprisonment for all who used them. It was quickly pointed out, however, that under a make-shift system it was often necessary to use non-slipping devices, though

they might be injurious, which would be unnecessary under scientific methods of road construction.

Robert Philipps, consulting surveyor of the Gloucester County Council, was of opinion that rubber tired vehicles did not require a very strong road, but they must have a smooth surface, the effect of pneumatic tires jumping from ridge to ridge being to file or grind the upper surface of the metal, suck out the binding material and loosen the road. Below twenty miles an hour there was little damage; above twenty miles an hour the effect was serious. Beyond what was due to speed, little damage was done by either solid rubber or pneumatic tires.

Ideal Road Varied from Point of View.

The ideal road varied according to the point of view of the expert, influenced by the conditions under which he had been trained. Smooth granite paving was frequently advocated where traffic was heavy, either for cities or for main country roads. Made brick pavings, and various types of asphalts also found adherents though asphalt was not usually recommended except where traffic was of a lighter nature. "Nothing but granite sets would withstand the constant effort of traffic," declared several of the English experts, supplementing the statement, however, with the remark that the granite must be properly laid on a foundation of cement.

"A smooth basaltic or granite macadam road is the ideal for rubber-tired automobiles," declared Robert Philipps, one of the English delegates. "For both horse and motor traffic it was necessary that the cross section should be as flat as possible, to prevent side slip; this kind of road was not at all detrimental to horse traffic, though rather difficult of drainage. All curves should have a radius sufficient to enable approaching vehicles to be seen around the curve. All roads joining at right angles should be trumpet mouthed at their junction."

The excessive crown of roads was in the opinion of M. Moissenet, chief of roads and bridges at Montauban, one of the causes of unnecessarily rapid deterioration.

In order to preserve pavements and roadways Engineer Caldagues, of the Paris roads and bridges department, insisted on the necessity for more and more proscribing the placing of gas, electric, and water mains under roadways. When a departure has to be made from this rule, the road department should reserve to itself the care of replacing the roadway against reimbursement on a suitable tariff.

Harder and better material was constantly insisted upon for macadam roadways, in order that they might be able to resist the effect of fast traffic. There should be increased cohesion by longer rolling, by the use of proper binders, and by surfacing with tar. Tar roads, which have been very extensively experimented with in France, were not received with full favor by the congress. It was only after long discussion that a non-

committal resolution was passed, in which the conference "recommended paving for a remedy against dust where traffic was heavy and intense. Crude oils and deliquescent salts were a remedy against dust, but were only ephemeral in their results. The congress believed that tar was undoubtedly a remedy against dust, that in a certain measure it protected the roads against the destructive effect of automobiles."

France is more interested in the building of tar roads than any other nation, having at the present time 1,400,000 metres of tar roads, compared with 550,000 square metres for England, and 510,000 square metres in Germany. Dr. Guglielminetti, the president of the Anti-Dust League, was of opinion that if tarring could not replace asphalt or paving on roads of very heavy traffic, it gave excellent results on roads of moderate traffic, and especially where automobile traffic was very intense. The skin of tar prevented the pneumatic tire from sucking up the binding, and for this reason prevented the grinding down of the roadway. In Paris tar surface has increased from 21,000 square metres in 1904 to 360,000 square metres in 1907.

F. G. Carpenter, of the West Riding of Yorkshire, was of opinion that nothing was so effective as the use of tarwashing. The application of tar forms a waterproof sheeting over the surface of the road protecting it from the weather and thereby lengthening its life. The best result was obtained after a new sheeting of metal had been rolled in and allowed to dry, when the tar penetrated the surface much more deeply than on application to an old or partly worn surface. A lengthening of the life of the macadam of about 20 per cent was obtained by the use of tarwashing.

Experiments with Tar-sprayed Surfaces.

A feature of the different visits to Paris and the immediate suburbs was the opportunity for examining the latest experiments of macadam roads with various kinds of tar-sprayed surfaces, and such methods of construction as Tarmac, Pitch-macadam, Aeberli and others, in which the material to be used is prepared and mixed with tar before being brought to the road under construction. As many of these processes were in an experimental stage, the congress, while recognizing that the suppression of the dust nuisance was doubtless to be found in this direction, did not pronounce definitely in favor of any one system. The future will tell.

Road signs were discussed entirely from the European standpoint, the points insisted upon being simplification and a reduction of the number of signs in use. Jacques Ballif, president of the Touring Club of France, protested against unnecessary matter on the government sign posts, asking what use it was to be told on every post that the road was a departmental or national one. The omission of such matter would tend to simplicity. The president of the Touring Club of France agreed to abandon the word signs which are at present in use in favor of a system of wordless signs as used by the Association Generale Automobile. It was decided that four signs were all that were necessary: to indicate danger points, frequent turns, railroad crossings, and dangerous cross roads. The A. G. A. signs, which were used in the last

Vanderbilt Cup race are at present about twelve in number, the warning being given by a simple white diagram on a black ground, without any necessity for wording. Several thousand Touring Club of France signs have been put throughout France, and are still useful for slow traffic. For fast motor traffic they have considerably diminished in value, for it is generally impossible to read them at speed, and they are placed too near the danger spot to be effective.

Roads Exhibition Attracted Attention.

Apart from the deliberative gatherings, a very extensive roads exhibition attracted much of the attention of the members of the congress and the general public. The exhibition united a vast amount of material connected with the building and maintenance of roads, and several useful comparative exhibits from city councils, road departments, etc.

The city of Paris put forth an interesting comparative exhibition of its experiments in the adoption of mechanical substitutes for horse traction in the street sweeping and watering department. The first mechanical sweeper and sprinkler was a steamer adopted in 1901, and still doing service. As its weight, however, is nearly eleven tons, its effect on roads is such that it cannot be considered a complete success. The second mechanical sweeper was operated by a two-cylinder Aster gasoline motor, which gave excellent service and is still in use. Three years ago a larger sweeper and waterer was adopted, the motive power being a two-cylinder De Dion of 15-18 horsepower, driving the vehicle at 8 to 9 miles an hour. Except that the power was found to be rather low, this was considered very satisfactory. It had been decided to take out the two-cylinder motor and substitute a four-cylinder model of the same make. A Mors watering cart was shown for use on wide avenues where traffic was fast and intense. Its four-cylinder 24-horsepower engine gave a speed of 10 miles an hour, which was sufficiently fast to avoid interfering with traffic, and its sprinklers could cover a width of 70 feet at one watering.

There were one or two cases of the conversion of horse-drawn sweepers to gasoline-driven machines, by the adoption of a front drive device, a two-cylinder gasoline engine transmitting power through longitudinal shafts and universal joints to the front road wheels. The rear portion of the machine was unaltered, the drum being revolved from chains on the road wheels, as in the old horse system. The experiment had been found more economical than the abandoning of horse material.

Also in the city of Paris exhibit were several examples of portable single-cylinder De Dion gasoline engines mounted on a suitable stand and driving a wood-block trimming machine. The outfit was naturally for use on the streets, and was used where no electric mains were laid. Where electricity was obtainable it was preferable to use an electric motor link up to the mains.

Among the private exhibits of the application of motor vehicles to road maintenance purposes were several mechanical sweepers, one of the most pleasing being fitted with a two-cylinder Renault engine carried forward and driving by propeller shaft an internal gear to the road wheels, the drum being operated by sep-



A Typical Road in France, of Which There Are Many.

arate shaft and single chain. This idea attracted careful examination, and proved to be a most interesting exhibit.

Among the American delegates taking part in the congress were: H. H. Cross, Chicago; Samuel C. Lancaster, Professor Highway Engineering, University of Washington, Seattle, Wash.; Samuel Hill, president Washington Good Roads Association; R. H. Thomson, city engineer, Seattle, Wash.; E. L. Powers, publisher *Good Roads Magazine*, New York; Harold Parker, chairman Massachusetts Highway Committee, Boston; Austin

B. Fletcher, secretary Massachusetts Highway Committee, Boston; Chandler Withington, chief engineer, Department of Finance, New York City; Arthur W. Dean, state engineer, New Hampshire; Nelson P. Lewis, New York; G. L. Clarke, Boston; William S. Hogan, New York.

Papers were presented by Ch. W. Ross, Newton, Mass.; L. W. Page, U. S. Board of Public Roads; Col. Chas. S. Bromwell, Washington; Clifford Richardson, New York City; John A. Pettigrew, Boston, and Philip W. Henry, New York City.

SECOND ROAD CONGRESS WILL BE HELD IN 1910

PARIS, Oct. 26.—The 2,250 members of the first International Road Congress have dispersed to their respective twenty-nine countries, leaving behind as a permanent record an international road office established in Paris, a mass of decisions regarding road building and maintenance for automobile traffic, and a resolution to meet again in Brussels for the second confabulation during the Belgian Exposition of 1910. At this second meeting the delegates will be the guests of the Belgian Government.

Considerable value is attached by all the members, and especially by the American delegation, to the formation of the permanent association, controlled by an international commission, and having offices in Paris. It is this association, composed of two members per nation, and having as its temporary officers those who administered the present Congress, which will be responsible for the second gathering at Brussels. Its most important work will be to collect information regarding experiments in road building, to organize and encourage chemical and mechanical experiments with tar and other road building material, and generally assist in the adaptation of highways to modern conditions of locomotion.

Conclusions of the Final Assembly.—These, after discussion in the sections, are somewhat voluminous, and are not limited in their application. Dealing with the present road the congress found better material should be used, and that greater attention should be paid to foundations. A cement bed 4 to 6 inches thick should be paid for all pavings, whether with large or small blocks. There should be a thin layer of sand between the foundation and the blocks. Experiments with tar or bituminous products incorporated into the road-making material were recommended, in order to arrive at some cheap and efficient method of carrying on this work. Paving with small stones having been reported to give excellent results as regards resistance and cheapness, it was recommended that they should be further tested with various kinds of traffic.

General Methods of Maintenance.—Complete resurfacing, in place of partial repairs, was recommended. Also the entire width of the roadway should be resurfaced at one operation wherever possible, the traffic being turned off into side roads while work was in progress. Hard and homogeneous road material only should be used, the binder should be suitable to the road, and moreover reduced to a minimum. Authority to lay water, gas, and electric mains under paved roads should only be granted in exceptional cases, and for want of any other practical solution.

Anti-Dust Crusade.—Paving and other improved surfaces were recommended as a remedy for wear and tear, as well as to remove the dust nuisance. It was considered that oiling, the use of deliquescent salts, etc., were efficient as a dust remover, but their benefit was not of long duration, and their use could only be recommended for special occasions. Planting of trees along the roadside was recommended with a view to the suppression of dust. The official decision on surface tarring was that when well carried out it was undoubtedly an efficient remedy against dust and that to a certain extent it protected the roads against the destructive action of fast vehicles. Experiments in tar-made roads were not considered to be sufficiently advanced to allow of a decision. Experiments, however, should be encouraged.

Future Roads.—That it should be well constructed of hard material, resisting and not slippery, was understood. In addition the future road should have a single track for all vehicles, with the exception of high-class avenues, and in no case should the width be less than 20 feet. Camber should be as low as possible, compatible with efficient drainage. The radii of curves should be as great as possible, and in no case less than 164 feet, while the outside should be banked slightly. Nothing should be allowed which would obstruct the view at curves; intersecting roads should be visible and very wide; grade crossings should be avoided, or if this were impossible they should be properly announced both day and night. A narrow footpath on the inside of all curves was highly recommended, with a strict law against dumping road material on it. Though multiple track roads were not recommended, except in special cases, it was believed that cycle tracks and horse paths should be laid on the side of the road. The line of the road should be clearly defined by trees.

Effect of New Modes of Locomotion on Roads.—The Congress being composed in majority of professional road-makers, with automobilists poorly represented, there was no attempt to minimize the damage done by mechanical vehicles. Fast vehicles were declared to disintegrate the road by scattering the binder, the damage being in proportion to the speed. Too harsh an application of brakes and rapid acceleration were responsible for injury, while changes of gear did damage, though in a smaller degree. Hardened metal-studded tires were condemned, smooth tires being recommended, or if really necessary, studs of soft metal. Chains, being unknown to Europe, were not discussed. Heavy commercial vehicles should have smooth rims except in special cases and on certain roads. Heavy vehicles were declared to cause injury by depressions and ruts, and to avoid this the pressure per inch of tire should be as light as possible. A maximum of 825 pounds per square inch of tire, with diameters at present in vogue, was voted for.

Road Signs.—A uniform system of marking distances for the entire country was recommended. Unnecessary matter on sign posts should be eliminated. There should be four road signs only, announcing danger spots on the road, sharp turnings, grade crossings, and dangerous cross roads.

Road Services and Mechanical Transportation.—An average speed of 11 and a maximum speed of 15½ miles an hour were recommended for all large passenger-carrying vehicles, omnibuses, etc. The weight of the driving axle should be reduced to a strict minimum and in no case should exceed four tons. Heavy commercial vehicles were given an average speed of 6 and a maximum speed of 9 miles an hour, with an axle weight of five tons, the weight per centimeter of width of tire not to exceed 150 kilos with wheels of existing diameter.

It was the opinion of the congress that light railroads should be laid outside the bed of the road; wherever it was practically possible these lines should be on special tracks leaving a width of roadway of not less than 16 feet. When trolley car tracks had to be laid in the roadway they should be at the level of the surface, without projections or depressions, and without any change of profile, either transversely or longitudinally. The roadway should be such that a width of at least 8 feet would be provided clear of the portion on which the trolley cars run.

ABOUT AUTOMOBILE SPRING SUSPENSIONS

By THOS. J. FAY, PRESIDENT SOCIETY OF AUTOMOBILE ENGINEERS.

THE reason for the adoption of springs will best be understood if we take into account a version of the law of the application of forces. As, for illustration, if a "tup" is tripped and it falls 10 feet, provided it weighs 100 pounds, the energy of position of the tup will represent 1,000 foot pounds, and when it strikes the energy will be expended, manifesting itself in heat and other vibrations. It cannot be said that the effective force

than do others, it would seem as if the springs of the inferior results should be eliminated. On the other hand some types of springs work well on certain classes of cars and are valueless in other cases. This being so, it does not follow that all springs should be of the same type and all cars should be swung in the same way.

Several Types of Springs.

In relation to this matter it might be thought the types could be arranged after some fashion logical. On second thought it is to conclude there is no logic in this connection, because the several types of springs were used from time to time on all the types of cars extant. It will not seem out of place, therefore, to enumerate the types of springs largely as they appear on cars at the present time. They may be set down as follows:

(a) Half elliptical; (b) full elliptical; (c) full elliptical, one end scroll; (d) full elliptical, both ends scroll; (e) three-quarter elliptical; (f) three-quarter elliptical, one end scroll; (g) three-quarter elliptical, riveted end; (h) platform; (i) concord; (j) helical.

Each of these types of springs are shown in the illustrations, and each of them will be found in cars, unless it is a fact that the

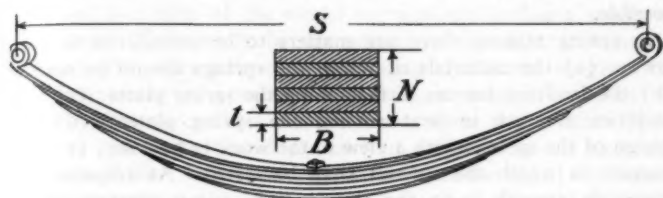


Fig. 1.—(a) Half elliptical spring, showing sections referred to in the formula.

of the blow will be as 1,000 foot pounds, because the effectiveness of the impact of the tup will depend upon the distance in which the motion is arrested. If, for instance, the motion is arrested inside of a distance of one inch after initial contact, the blow will be equal to, say, unity. But if the blow is arrested within one-half inch after initial contact, the force of the blow will be doubled. But should the anvil give but a thousandth of an inch, the force of the blow will be equivalent to one thousand times the force as first put down.

In this we have an illustration of the fact that it is not the weight of the body or the distance it migrates that goes to make the sum total of results; indeed, it is a question of the distance in which motion is arrested for the most part. Coming down to the automobile, it is plain to be seen that the spring suspension of a chassis frame and the superimposed body will be effective in proportion as the springs show capability, by way of arresting the motion within the distance said to be agreeable and at a periodicity of the pendulum action also said to be agreeable.

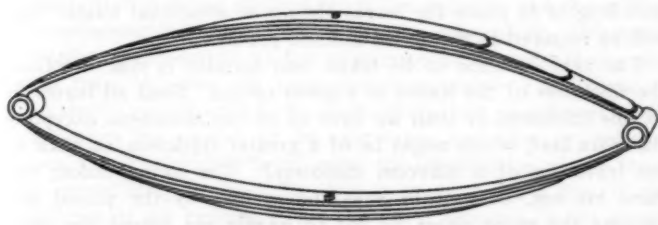


Fig. 2.—(b) Full elliptical spring.

Obviously, then, there is no standard to go by, because what one man calls agreeable, another may call something else. On the other hand, this question of what constitutes an agreeable motion can be put to some extent in dollars cost, since the anticipations of pleasurable riding will depend considerably upon how much the autoist has to pay for the pleasure. If a car is high in price, and the spring action is so terrible as not to compare favorably with the spring action in comparatively low priced cars, the unlucky autoist will consider the action disagreeable, and justly so. If, on the other hand, a car is very low priced, the purchaser thereof may be quite well satisfied with a very inferior spring performance. He may, for that matter, get all that he pays for. Under these conditions, it is difficult to appreciate what should constitute the standard spring suspension from the point of view of result, rather than the point of view of the manner of suspension.

If some types of springs do the work, affording better results



Fig. 3.—(c) Full elliptical spring—half scroll spring.

helical spring is no longer used as a direct suspension, nor has it ever been to any great extent, although it is well represented in the shock absorbers of the day.

Considering laminated plate springs, since they are all modifications, they can all be resolved through the use of a single formula by a step to step process. Such a formula, for illustration, might be as follows:

$$N = \frac{W S k}{b t^3}$$

in which:

S = span in inches (see Fig. 1);

b = breadth of plates in inches;

t = thickness of plates in 1-16 inch units;

W = load in tons (2,240 pounds);

N = number of plates;

k = a figure of convenience = 11 in ordinary work = 15 in the best automobile practice, and can have values between 11 and 15 as the exigencies of the service may indicate.

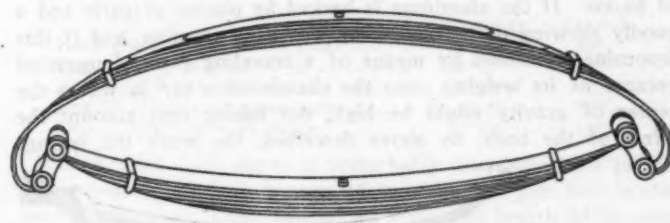


Fig. 4.—(d) Full elliptical spring—both ends scroll.

In laminated springs, ribbed cross sections are more rigid and much used in commercial vehicles, also in connection with pleasure automobiles abroad, otherwise, the plates are usually with



Fig. 5.—(e) (g) Illustrating a three-quarter elliptical spring.

round edges, but are not flat, as may be generally supposed. They are concave, and the difference of the thickness at the center is about equal to 1 B. W. G. thickness. Such plates are used in sizes as follows:

B. W. G. Nos.	Thickness in inches.
0 .....	.34
1 .....	.30
2 .....	.284
3 .....	.259
4 .....	.238
5 .....	.22

In automobile work there are few, if any, examples of springs, in which the thickness of plates will be found, to be thinner than No. 5, or thicker than No. 0, B. W. G.

In some cases the plates are quite rectangular in section, the edges being flat, with a slight radii at the corners. In other cases the spring leaves are ribbed, illustrations of which will be found elsewhere in this article. There is one other point, as shown in Fig. 7, which takes into account the contours of the ends of the short plates. It is believed by some spring makers, and the author has a superstition or two in relation to the same matter, that the behavior of a spring is effected by the shape or contour of the ends of the short leaves or plates. At all events, the short plates should be tapered down toward their ends, and if a supple spring is the aim of the designer it might even be well to terminate the ends of the short leaves in what is designated as the "French" contour. This contour looks very well in the finished product and possesses the advantage of more gradually bringing the shorter leaves to the support of those of greater length.

While this question of suppleness of springs, which might otherwise be termed easy riding qualities, is on the tapis, it will not be out of place to discuss some of the means by which easy riding qualities may be arrived at. In the first instance it is passing strange that the designers of some cars should expect any one to furnish springs such as would afford easy riding qualities. Take, for illustration, a limousine of the most approved artistic appearance, let us say of aluminum, and at a cost of \$2,000. If the aluminum is backed by plaster of paris and a goodly showing of hardwood, by way of a framing, and if this limousine is hoisted by means of a traveling crane (suggested because of its weight) onto the chassis of a car in which the center of gravity might be high, not taking into account the effect of the body, as above described, the work the springs



Fig. 6.—(h) Characteristic platform type of spring.

would have to do can scarcely be regarded as coming within the province of springs.

The conditions are not all included, because it is just such a body and just the car described that will have a water tank on the deck of the limousine and perhaps two or three tire cases and other paraphernalia. The "top hamper" will, therefore, mount up to figures quite beyond the "top hamper" that should obtain, even under more favorable conditions. There are no springs, either by way of types, or in the matter of design, that will afford easy riding qualities under the conditions as above illustrated. Indeed, it may be fortunate, but it is a fact, too, that there are no tires that will sustain under such conditions, and so we may say, if the spring problem is severe, the tire problem becomes impossible.

In spring making there are matters to be considered as follows: (a) the materials of which the springs should be made; (b) the facilities for use in fashioning the spring plates; (c) the facilities for use in heat-treating the spring plates; (d) the design of the springs with a view to the work to be done; (e) the manner in which the springs shall be tested. As respects the materials, enough is to say they will be given separate space hereafter. When it comes to the question of the facilities for use, in fashioning the spring plates, it will be easier to state what should not be done rather than to elaborate upon the other phase of the question. At all events, the material comes in mill lengths, and the leaves or plates have to be cut from this material, so that the first thing to consider is whether or not the texture of the material is altered by the shearing process used in cutting the spring plates from the lengths as they come from the mill. The author is of the opinion that the texture of the material is

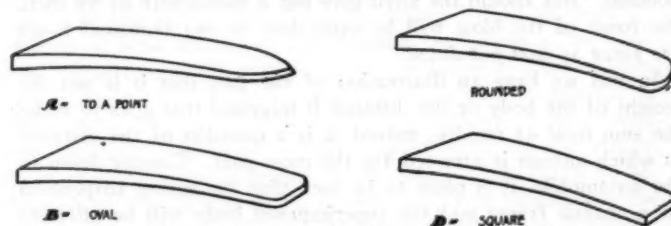


Fig. 7.—Four customary types of end trimmings.

altered for perhaps a full half inch back from the point of shear, and so it would seem that the lengths as cut from the mill lengths to make the leaves should be somewhat longer than will be required in the actual finished product.

The next question to be taken into account is that involving the thickness of the leaves in a given spring. Shall all leaves be of one thickness, or shall we have all of one thickness, excepting the main leaf, which might be of a greater thickness, or shall all the leaves be of a different thickness? The spring maker will have his say, because he sells the springs by the pound and because the more plates he has to handle per pound the more work he will have to do per dollar. If the spring maker fixes the pound price first he will then be inclined to fix upon the least possible number of leaves for the spring, thus giving him the maximum weight for the minimum cost, hence increasing his profit at a previously fixed price.

It is not intended to say that spring makers deliberately start out with the idea of skinning, but it is believed that they may beguile themselves into thinking that the less the number of plates in a given spring the less the chance of breakage for that reason alone. Of course, they know that for a given camber, the thicker the leaf the greater will be the extreme fibre strain, and with them it is a compromise as between cost and risk of breakage, due to overstepping the bounds from a fibre strain point of view. The same spring makers are justified in their course to some extent, for the reason that easy riding qualities are more nearly approached as the fibre strain in the material used more nearly approaches the elastic limit of that material. The danger lies in exceeding the point of safety, from the point of view of kinetic ability of the steel used.

(To be continued.)

WHAT IS THE BEST MOTOR TIMING?*

By LOUIS LACON.

WE have already shown that it is necessary to wait until there is a degree of depression in the cylinder before opening the inlet valve, and it will be apparent that even a considerable lag will produce but little depression. If the cylindrical volume be $\frac{3}{4}$ -litre, or 750 cu. cm., and the dead space $\frac{1}{4}$ -litre, or 250 cu. cm., a displacement of 25 cu. cm., is necessary to produce in the cylinder a vacuum of 0.1 atmosphere. Now, 25 cu. cm., correspond to 4 mm. of the stroke for a piston having a stroke of 120 mm. (Cylinder 89 by 120 mm.=750 cu. cm.) It is hardly necessary to state why an excessive lag should not be given the opening of the inlet valve, though such a practice would not be attended by any serious inconvenience, while a premature opening of the valve would permit the entrance of an excessive amount of air. This consideration explains the lag of the motors already mentioned, as well as the following: *Ours* (1), 15 degrees; *Hotchkiss* (7), 17 degrees; *Brouhot* (9), *Rochet-Schneider* and *Cornilleau Sainte Beuve* (10), 20 degrees; *Berliet* the same as *Hotchkiss*, and *Aries* (25), 18 degrees. Larrad recommends 17 degrees.

Which Should Operate First?

This brings us to the third question, which is raised by the timing of the *Mutel* (11), *Larrad* (31) and the *Peugeot* (17) (Beaulieu). Larrad, for example, recommends a 17-degree lag for the inlet and 22 degrees for the exhaust. During the intervening 5 degrees, both valves are open. Is this an advantage? But it can easily be seen that Larrad's theory can be sustained. Valves do not operate instantaneously, he maintains. If the inlet valve begins to open 17 degrees beyond the dead center, 5 degrees later, it will not be open more than a fraction of a millimetre. Likewise, if the exhaust valve remains up to the twenty-second degree, at the seventeenth it would not have been much nearer to closing, and the advantage is gained that the inlet and exhaust are both more free during their limited period, while the fact of both valves being open at the same time produces, with mechanically operated valves, the same effect as is realized with the automatic valve; the exhaust continues as long as there is any excess of pressure in the cylinder, and the aspiration commences the moment there is any depression. This point is easily demonstrated as the movement of the gas in the exhaust manifold does not cease instantaneously. The inertia of the gaseous mass continues to draw out the last particles of burnt gas, despite the opening of the inlet valve, and when the exhaust closes, the inlet already being open, the introduction of the fresh gas immediately begins. To this, it might be said that if the beginning of the aspiration had any great influence on the power of the motor, or upon its efficiency, this theory would not be debatable, or would at least, be well justified. But it has neither. The slight initial depression scarcely has any effect on the upward movement of piston, particularly as it is so shortly afterward descending under the ordinary depression of aspiration.

So far as the volume introduced during the admission stroke is concerned, this may be measured by the displacement of the piston between the point that the exhaust valve closes and the point of closing the inlet valve in turn, assuming in both cases that an equilibrium of pressure has been established between the interior of the cylinder and the external air. Thus it matters little whether the inlet valve opens before or after the exhaust. If the exhaust closes, for example, when the piston has descended 1.5 mm. of its stroke, and the inlet opens but an instant later, the first inrush of fresh gas will begin to fill the space traveled by the piston after this 1.5 mm. of the stroke;

the introduction of the gas will be somewhat retarded, but it will take place nevertheless. If the inlet valve is closed 6 mm. after the piston has reached the dead center, there will be 6 mm. of the stroke less explosive gas in the cylinder and the useful volume will be reduced by 1.5 mm. at the beginning and 6 mm. at the end, or 7.5 mm., or a deficit of .075 per cent., assuming the length of the stroke to be 100 m. This reduction of the volume and the consequent loss of power must be regarded as a necessary evil, for if the valves were opened and closed at the dead center, the loss would be even greater.

Should Both Valves Be Open at Once?

We are still far from having arrived at an answer to the third question and it is now opportune to revert to it. It seems that among those, such as the *Unic* (29), for example, which allow an interval of 24 degrees between the closing of the exhaust and the opening of the inlet, and those which, like the *Larrad*, open the inlet before closing the exhaust, there is certainly a sufficient range in which to find a mean. Without exaggerating the lag given the opening of the inlet, it seems to us that it should be slightly later than the closing of the exhaust. Imperfections in the actual timing on the motor itself will soon suffice to modify the predetermined arrangement by 4 or 5 degrees. Take a motor with a complete index on the periphery of its fly-wheel and a pointer on the crankcase corresponding to it, and order a repairman to time it exactly, and it is quite probable, that, whatever be his skill, he will not strike it by several degrees. As a mean average, it may be estimated that this error will amount to 2 degrees each way, or 4 degrees in all, and it would seem necessary from this to open the inlet 4 degrees after the closing of the exhaust. This is the regulation of the *Eudelin* (21), the exhaust having 4 degrees lag, and the inlet 8 degrees, while the *Motobloc* (5), is practically similar with 5 and 10 degrees. The *Hotchkiss* (7), allows slightly more, the exhaust having 10 degrees and the inlet 17 degrees, the *Berliet* (12) being still further apart, i.e., 9 and 17 degrees, or 8 degrees apart. These figures all appear well founded.

Should we, in view of all these diverse timing arrangements attempt to distinguish what may be called the typical regulation? We hardly believe so, for, as we have already mentioned a number of times, the amount of advance or lag depends upon a number of variables in one motor and another; we might almost say from one cylinder to another, and those who have made much use of the manograph would probably not differ with this. A standard regulation would then be very poor for extreme cases, and if the little instrument of which we have been speaking, could improve many of the timing arrangements, it could hardly pretend to produce the maximum output or efficiency in every case, as its inventor claims. But in spite of all, we can by way of further information, give a résumé of the mean of all the angles as compared with the *Larrad*. These are:

	Mean average.	Larrad.
Lead given the exhaust valve.....	46°20'	52°
Lag in closing inlet valve.....	25°32'	17°
Advance of the ignition.....	31°15'	var.
Lag in closing exhaust valve.....	5° 8'	22°
Lag in opening inlet valve.....	12°16'	17°

The *Brasier* (16) shows a remarkably close approach to this mean, coming within 5 degrees of it, while its r.p.m. rate is also near the average, 1,350, instead of 1,370, the length of its connecting rod being the same, 4.5 instead of 4.6. It is not to be inferred from this that many of the others are not equally good. The best are to be found in the *Motobloc* (5), *Hotchkiss* (7), *Cottin Desgouttes* (8), *Cornilleau Sainte Beuve* (10), *Mutel* (11), *Berliet* (12), *Eudelin* (21), *Farcot* (22), *Aries* (25), *Sultan* (27), *Renault* (28), and *Unic* (29). In order to be able to judge

*Paper read before the Society of Automobile Engineers at its Cleveland Meeting, September 18-19, 1908. Translated from the French of "Omnia," by Charles B. Hayward. Continued from page 607.

Note—The occasion for the present article was the appearance of a device known as the Larrad for indicating proper timing.

of the others, it would be necessary to know more about their mechanical arrangements.

Having divided these degrees of the circumference of the circle so carefully and arranged them as indicated, is it possible to learn the time in which the motor takes to traverse the vari-

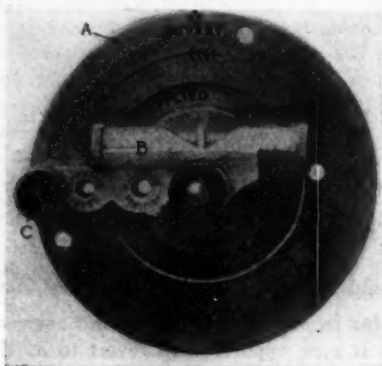


Fig. 1.—Larrad apparatus for regulating the timing of motors. A, disc, pierced with a series of holes; B, spirit level, in the case of which is a hole for each of the preceding series; C, pin to secure holes in different positions. Arrow indicates direction of rotation.

ous divisions? Take for example, No. 30; it makes 1,700 r.p.m., describing in *one second*, 10,200 degrees. Each degree is thus divided into less than 0.0001 second, from which the extreme rapidity of the performance of each one of the parts of its cycle necessary to its efficient working may be realized. And still some designers refuse it a poor little thousandth of a second in which to perfect its exhaust. Those 10 degrees of retard would probably still further improve a motor already remarkable.

Description of the Larrad.

As shown by the illustrations, Figs. 1 and 2, this device consists of a plate *A*, mounted on a shaft *E*, integral with the piece *D*, a spirit level *B*, and the pin *C*. In the plate are three series of holes, while in the piece to which the spirit level is attached, there are but three holes, one for each series, and the pin is used to insure the registration of any two holes. To use the device, the part *D* is attached to the crankshaft, or any part that turns with it, this being arranged so as to most conveniently suit the circumstances. For example, it could be placed between the cone and the flywheel where it would be firmly held against movement. Its only conditions of mounting are that the shaft *E* must be parallel to the axis of the crankshaft, so that when turned, this shaft will describe a circle round the axis of the motor shaft, and not a cone; second, that once the plate *A* has been fixed in position, it can be revolved without coming in

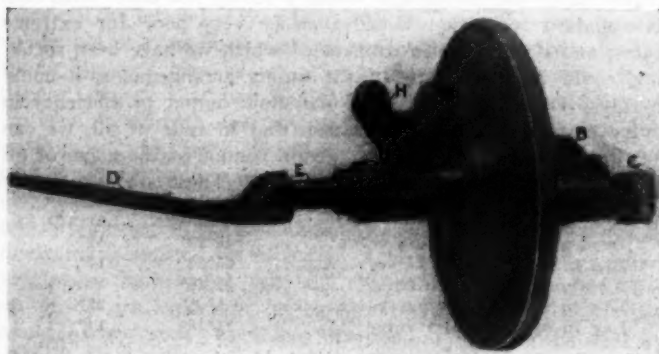


Fig. 2.—Profile view of the Larrad. A, disc; B, spirit level; C, pin; D, blade for attaching; E, shaft to be fixed parallel with the crankshaft; H, winged nut fixing disc A to shaft E.

contact with anything. This second condition is frequently very difficult to comply with when a motor is mounted on the chassis, although the *Larrad* can be mounted on the starting crank, but the accuracy of the timing thus secured might be questionable.

Assuming that the piece *D* has been attached to the motor

with the shaft *E* perfectly parallel with the axis of the crankshaft, the operation is commenced by registering the hole marked *exhaust*, with the hole *zero*, which corresponds to the upper dead center. The motor is then turned over, either with the crank, or by pushing on the flywheel until the piston reaches the upper dead center. The plate *A* is then turned until the spirit level shows that it is perfectly horizontal; the screw *F* is then tightened, fastening the plate *A* to the shaft *E*, and the device is then ready. See Fig. 3, No. 1. Then drawing out the pin *C*, it is inserted in the holes already mentioned, and the motor is turned until the spirit level is again horizontal. This will indicate the exact position at which the tappet should begin to raise the exhaust valve. See Fig. 3, No. 2. All the other essentials of the timing are regulated in the same manner and without removing the device from its support. In this manner, the screw is inserted in the hole *exhaust* of the socket, and the hole marked *closing*, on the plate, the motor then being turned over again until the level indicates the horizontal. The instrument simply indicates the different positions of the crankshaft corresponding to the different essentials of the timing. It must be borne in mind in using it that the cycle occupies two revolutions of the motor, and that the plate *A* to which the level *B* is attached, be so fixed that the direction of the arrow *G*, corresponds with the direction of rotation of the motor. It will be seen that the apparatus is very easily employed and that it permits of great accuracy of regulation, besides avoiding errors. It is quite probably that with frequent use by different

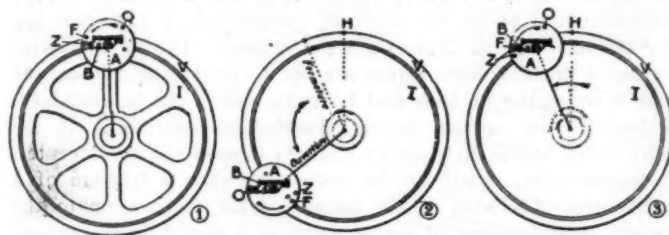


Fig. 3.—Larrad apparatus mounted between the cone and flywheel. 1, position of upper dead center; 2, position of opening of exhaust; 3, position of closing of exhaust. A, disc, pierced with holes; B, spirit level; F, closing of exhaust; H, dead center point; I, clutch cone; O, opening of exhaust; V, flywheel; Z, upper dead center point.

designers, they would be able to modify the plate to suit their own motors. Unfortunately, up to the present, the inventor has only provided the single plate mentioned, claiming that the regulation he has outlined is the only perfect one.

THINGS THAT MIGHT BE LEFT UNDONE.

Familiarity with the appearance of the motor-car on the one hand, and some amelioration of its design on the other, have done much to remove the charge of ugliness that was so often thrown at the auto in its early days. A good deal remains to be done before the eye of the artist will be satisfied, and some things should be left undone. Under the latter heading may be included the undue use of covers. One may approve the carefulness of the man who fits neat dust covers to the upholstery, though somewhat as one may smile at the prim old lady who concealed the legs of her piano in—er—garments for decency's sake, but the running of a car with the lamps swathed in chamois leather bags is surely an example of the unco' careful that is calculated to arouse unfavorable impressions. A bright lamp is doubtless a thing of beauty, but it will not be a joy forever if it is concealed under an article, which, if not a bushel, is equally impenetrable by the eye of man. If the lamps are to be carried and coddled at the same time let them be stowed in an inconspicuous locker constructed for the purpose, not paraded around in a manner suggestive of cocoanut shies and curling papers. But if bright lamps must be hid under a bushel, does it not suggest some other finish for the lamps? Something besides brass, such as oxidized iron, for instance.

NEW ENGLAND SHOPS ARE MORE THAN BUSY

By CHARLES B. HAYWARD.

If those there be who are still skeptical regarding the present highly prosperous condition of the automobile industry, and the fact that the prospects for the coming year are far and away better than they have ever been at any time in its history, a visit to some of the New England factories would certainly do much to remove this impression. In some things New England is sectional, but as its automobile output finds its way to every part of the country, frequently being as well represented on the Pacific coast as it is in the East, there can be no doubt but that the prosperous conditions prevailing there are duplicated by other automobile manufacturing centers, and that the healthy activity to be found in every plant east of the Connecticut State line is reflected in the full-force working conditions of every automobile factory of note the country over.

Bridgeport Takes Pride in Locomobile Plant.

Bridgeport takes considerable pride in the presence of the Locomobile factory in that city, as was strikingly evidenced recently by its spontaneous outburst of enthusiasm on receiving the news of Robertson's victory in the Vanderbilt race, and its regard for the big plant as a home institution extends to its product as well, for to the Bridgeporter the Locomobile is the one real car, and he is willing to back his belief with his money, as is amply substantiated by the great number of locally owned machines. This pride is further quickened by the spick and span equipment of the fire department supplied by the home factory, and that the reputation of the Locomobile company in this field is not merely local is shown by the presence of several special jobs of this kind now under way at the factory for several other New England cities. Two of these are specially designed chemical auxiliaries and the other is a hose truck. All are being constructed on the regulation 40-horsepower, chain driven Locomobile chassis, a special feature being the use of pneumatic tires on all of them. The tire equipment is being supplied by the Fisk company, and consists of 40 by 6-inch rears, which indicates that New England municipalities are not averse to paying the price of speed when it is a question of getting there a little sooner.

These special jobs are naturally but a very small part of the activities of such a factory as the Locomobile plant, the bulk of the work now being carried on consisting of the first series of the new Model L shaft-driven "Thirty" Locomobile for 1909, which is already coming through in numbers. This is supplemented by the work on the 40-horsepower chain-driven car, which is being continued without any changes of importance for the coming season, and the calls for a car of this type show that it will be a long while before the chain-driven model disappears entirely, if such is ever the case, as for machines above a certain power it has many faithful advocates, who will probably always remain true to their convictions in this respect. This is shown by the remarks of former buyers of Locomobiles who have had an opportunity of viewing the new shaft-driven model. "It's a beauty, but a chain drive would make it perfect," sums up the opinions of many.

In the Making of Motors Particularly.

Although not exactly a New England shop, the Jencick Motor Company's location in Portchester, right on the State border, practically brings it within this category, as it is the first of a long line of plants extending along the shore that make a specialty of marine motors. In addition to its routine work of turning out both automobile and marine motors of smaller sizes after special designs, there is now nearing completion there an eight-cylinder, 200-horsepower motor the ultimate mission of which will be to "trim" the *Dixie II* at the motorboat carnival at Palm Beach next spring. It is intended to form the power plant of the *Richard Croker, Jr.*, the hull of which is now under construction at the Herreshoff works in Rhode Island.

Speaking of motors takes one back to Bridgeport, where the American & British Manufacturing Company has plans under way for a large output of automobile motors during the coming season. The products of this concern is already finding its way into the chassis of more than one assembled car in the East, and it will figure as the power plant of at least one car that will have America's automobile center—Detroit—as its home. Motors of about 25 and 40 horsepower will be specialized, and facilities of the company make it possible to turn these out in large numbers at figures which cannot be approached by smaller builders. The Bridgeport Vehicle Company and the Royal Equipment Company are two other members of Bridgeport's automobile population, and both are hard at work.

Automobile Interests in Every Town.

It is pretty hard to find a town in New England that does not contain at least one factory which contributes its quota to the sum total of automobile building in this country, and there are probably few whose product is more widely distributed than that of the Manufacturers' Foundry Company, located in Waterbury, just north of Bridgeport. Within a comparatively few years this concern has developed the art of automobile cylinder casting to a point where the foreign artisan can no longer compete with the American product. Just north of Waterbury, in the little town of Torrington, spark plugs and other small specialties are turned out by the Standard Company by the thousand.

A twenty-minute ride east from Bridgeport brings one to New Haven, which is the home of the Bowers carburetor, Mayo radiators, Gilbert fabric specialties, tire cases, and the like, and the Cowles and New Haven carriage mountings and trimmings, from which it will be evident that every place "Down East," whether large or small, has its representatives.

Half way between New Haven and Hartford is the town that is probably better known for its silver-plated ware than any other in the world, but in the past few years it has jumped into prominence as the home of the Connecticut coils and other ignition specialties made by the Connecticut Telephone & Electric Company, and the pressure under which this concern is at present running strikingly reflects the demand in general.

Corbins for 1909 Well Under Way.

Within less than half an hour's ride from Meriden is the plant of the Corbin Motor Vehicle Corporation at New Britain, where every effort is now being centered on the production of the new models for the coming season. The first series of the water-cooled Corbins is already well under way, and at this factory the testing cars are put to an even more strenuous test than that of the two or three hundred mile road run under the watchful eye of the factory expert that is ordinarily given them, as the makers of the Corbin utilize their testing cars to a large extent in doing freight duty between New Britain and Hartford, thus expediting the delivery of much needed materials, and at the same time giving them the preliminary running in and inspection that is an essential step in the history of the chassis as it progresses from the first stages to its final delivery to the purchaser. Naturally, the freighters form but a small part of the fleet of Corbin testers on the road, but this utilization of the cars is but one example of the little economies now being practiced by automobile manufacturers, such as the use of the current generated by motors on the testing stand. Formerly this energy was wasted by being dissipated through a resistance, and this is still a more or less general custom.

Since the introduction of the new type of ball bearing developed by Mr. Rockwell, of the New Departure Company, Bristol has come into prominence as an automobile town, and this is to be further accentuated in the near future by its posing as the sponsor of a fleet of taxicabs, which will be the product

of the Bristol Engineering Works, where their building is already well under way. It seems somewhat of a coincidence that Designer Moskovics should also be using his first cars as freighters, and the loads of parts and other materials that they are called upon to tote over short and comparatively long jaunts, such as to New Haven, give excellent promise of their durability in their ultimate field of usefulness.

Hartford Is An Auto Center.

With two large factories and a host of smaller interests, Connecticut's capital city can well lay claim to being a New England center of automobile activity. With the prospect of the plan of reorganization now afoot being speedily completed, the entire plant of the Pope Manufacturing Company has been rushed to more than its full capacity for some time, night work having been the rule for several weeks past. It is said to be the ambition of the Pope Company that every resident autoist should be the owner of a Pope-Hartford, and to judge from the number of cars of this make continually seen about the city, it would seem that this desire has been realized to a very great extent. What with the continual stream of testers issuing from the plant on Capital avenue and the preponderance of privately owned cars of this make that are to be seen on every hand, it strikes the casual observer as if there were nothing but Pope-Hartford cars permitted there.

At the other big Hartford factory present activity gives promise of a brighter future than appeared to be in store for it since the Packard negotiations fell through. It can justly lay claim to having been the first completely equipped automobile plant to be established in this country, and while some of its equipment may now be out of date, there are few factories on this side of the water that can surpass its facilities for turning out work, and by work in this connection is meant as much, if not more of, the complete automobile than the average maker produces in his own shop. Some idea of what it is doing in a quiet way, and with far greater efficiency than was the case in its heyday, may be gained from the fact that between September 15 and the end of the year close to 200 of the 30-horsepower gasoline cars and 50 of the Victoria-phaeton type of electrics will not only have been manufactured, but actually sold.

Besides its two large factories, Hartford can boast of a multitude of interests devoted in greater or less measure to the automobile. It is the home of the Hartford and K-B universals, the Veeder tachometers, Richardson ignition specialties, and other parts makers, and is also the headquarters of one of the largest distributing houses, the Post & Lester Company.

Over the Commonwealth's Border.

Just above the Connecticut State line one strikes Springfield, which is congratulating itself on the excellent showing made by two Knox cars of stock pattern for 1909 against specially designed machines of far greater power in the Vanderbilt race two weeks ago, and when one comes to consider how very small these cars are compared with those built for nothing but racing, there is indeed good reason to marvel at their highly creditable and consistent performance, for, after all, what the buyer wishes most is endurance and reliability, and these were shown to a superlative degree. These two Knox cars of 38 and 45-50 horsepower respectively are the representatives of the Knox line for the coming season, on which the factory is now busy, and the prospects are that it will turn out more cars for 1909 selling than ever before in its history. Auto fire apparatus is also a Knox specialty to which considerable attention is being devoted, together with other commercial work.

Springfield is one of the few Eastern cities that can boast of being the home of a two-cycle car—the Atlas. One of the chief activities of this plant during the past year has been the manufacture of taxicabs, which are now to be seen in quite a number of the larger cities, and this will doubtless be the case to a far greater extent during the coming year, as with its extremely simple and reliable power plant the Atlas cab is one that can be entrusted in the hands of the unskilled driver with

far greater safety than where there are a number of small parts to be monkeyed with. Although the success met with in this field has caused a large part of the company's time to be devoted to building cabs, the work of turning out the regular models for pleasure use has not been neglected.

In addition to turning out two and four-cycle cars, Springfield can probably lay claim to manufacturing more motorcycles and more metal bodies than any other American town, the works of the Hendee Manufacturing Company, makers of the Indian motorcycles, being close to the Knox plant, while the Springfield Metal Body Company holds forth in another part of town.

Chicopee Falls, while so close to Springfield as to be practically a suburb, is proud of its independence, and, population considered, there is probably no other town in the country that contains within its limited confines automobile interests of such importance, as it is the home of the Stevens-Duryea Company and the Fisk Rubber Company, the plants of both of which are running in full blast. To say that the town is "Stevens-Duryea" through and through is to put it mildly. Outside of automobile circles, it has a reputation as the home of the Stevens firearms, and it also contains other important factories, but in the past few years the big automobile plant, which is constantly enlarging, has overshadowed them all. At present it is running through two or three hundred of the new Model X, four-cylinder cars, the specifications of which were made public last Summer. And as things go quickly at the Stevens-Duryea plant, there are cars in swarms. Soon it will begin to turn out the first series of the "Big" and "Little Six" cars, which will come forth this year in a considerably altered guise.

As for the Fisk plant, the most that can be said of it is that it is turning out tires and then more tires, and as that is its business in life, what more is there to tell about it?

Activities Further Eastward.

Worcester has numerous auto interests in the shape of the Baldwin Chain & Manufacturing Company and the drop-forging plant of the Wyman & Gordon Company, that turns out crank-shafts and other forged parts in large quantities; the White & Bagley Company, oils; Coates Clipper Manufacturing Company, Graton & Knight, the Windsor Manufacturing Company, etc. Boston has a multitude of auto activities, particularly when its numerous outlying suburbs, such as Waltham, where the Orient is produced; Beverly, the home of the Cameron; Lynn, where the G. E. Co.'s auto shop is located; Amesbury, with the Gray & Davis lamp works; Jamaica Plain, with the Napier, and a host of others too numerous to mention, are considered. It is the headquarters of the National Brake & Clutch Company, of cork insert fame, beside a number of other accessory interests, and is considered the best auto selling center east of New York, besides being the sponsor of more freak designs than have ever come out of any one town. The E. T. Burrows Company is bending its efforts toward making Portland, Me., an automobile manufacturing town, and the result will probably be seen at the shows.

Turning southward on the circuit, one strikes Providence and Pawtucket, the former the home of the American Locomotive Company, which is at present very busily engaged on a number of things that it does not wish to say anything about, while its entire force is kept working at high pressure to turn out enough taxicabs to meet the demand, as this is a specially designed machine throughout, and is built independently of the line of four and six-cylinder pleasure cars, not to mention the attention that the company is devoting to commercial work.

The Brown & Sharpe Company, Providence Engineering Works, Standard Machine Company, and American Ball Company are some of the other concerns a large part of whose product goes to swell the city's automobile output. As the home of one of the Maxwell factories, Pawtucket is another Rhode Island city that can lay claim to automobile fame, and the activities of the Maxwell plant there bid fair to carry its name all over the country during the coming year, if not to more remote parts of the globe.

LETTERS INTERESTING AND INSTRUCTIVE

THE SPECIFIC GRAVITY OF GASOLINE.

Editor THE AUTOMOBILE:

[1,613.]—Tel me how to read a Baumé hydrometer. The meter sank in the gasoline to 65 degrees.
Bastrop, La.

A. G. KNOX.

The specific gravity, in degrees Baumé (equivalent) for liquids lighter than water, will be found (at a given temperature) by means of the Baumé hydrometer scale. If this hydrometer has also a thermometer, the utility of the same will be obvious, since the specific gravity and temperature may be noted simultaneously. A separate thermometer would answer the same purpose.

The specific gravity of the gasoline is not constant under conditions of varying temperature, and it is best to reduce the temperature (always) to the same point (say 60 degrees F.) before noting the specific gravity in degrees Baumé. The temperature can be regulated by merely submerging the test tube (holding the gasoline) in a bath of water and regulate the water temperature by means of ice or hot water.

In conclusion, however, it may not be out of place to state that gasoline is not graded by the refiners, on a basis of specific gravity, and it is probable that the specific gravity even when measured, will avail nothing at all.

The fractional distillates of the hydrocarbons are graded within limits of temperature, at or near the mean temperature of ebullition, of the components. It is the temperature of ebullition then (at the atmospheric measure) that is wanted; not the specific gravity (mean of the components). Since the value of fuel is dependent upon its adaptability and that, in turn, is governed by the temperature at which the gasoline vaporizes.

USE OF LIVE AXLE WITHOUT DIFFERENTIAL.

Editor THE AUTOMOBILE:

[1,614.]—Kindly advise me in your "Letters Interesting and Instructive" whether a 1,500-pound automobile, with 28 inches wheel-base, could be operated without a differential; by this I mean using a solid live axle. Or would the strains in rounding corners tend to break the axle and cause severe wear on the tires—these to be of solid rubber? Supposing considerable care was exercised in making the turns, could the automobile be handled successfully?

Staten Island, N. Y.

HARRY LAWRENCE.

Unquestionably the automobile could be handled without the differential, but it would hardly be advisable to do so under ordinary circumstances, for every-day use. We believe that some machines of the high-wheel buggy type dispense with the differential, but these drive the rear wheels by ropes or wire cables, which allow a certain amount of slip. On the other hand, some high-powered racing cars have been built with solid live axles. If your machine is of the high-wheel type, and is not intended to make more than twenty miles an hour, you may do without the differential; but fitting one would be safer.

WHAT IS THE TERMINAL PRESSURE?

Editor THE AUTOMOBILE:

[1,615.]—I will appreciate an answer through "Letters Interesting and Instructive" to the following question: What is the pressure in the cylinder of a 4 by 4-inch motor just before the time of the opening of the exhaust valve, the motor, of the four-cylinder four-cycle type, running at 900 r. p. m. As the compression space of the motor varies greatly, I will ask you to take any standard motor.
New York City.

C. N. H.

It might approximate thirty pounds per square inch. In a given motor this "terminal pressure" is a variable depending upon the conditions as follows: (a) the carburetor; (b) the areas of inlet valves in relation to the areas of pistons; (c) the shapes of cams; (d) the design of the intake; (e) the speed of the piston; (f) the leaks of compression will lower the pressure; (g) the efficiency of the spark; (h) the timing of the spark; and other minor details, as cooling, etc. A statement of pressure, then, is the merest approximation.

IS THE STROKE PRODUCTIVE OF POWER?

Editor THE AUTOMOBILE:

[1,616.]—Please state through your columns which of the following two engines will develop the most power going at the same speed. First one with a bore and stroke of 4 1/2 by 4 1/2 inches, and one with a bore of 4 inches and a stroke of 4 1/2 inches.
East Orange, N. J.

SUBSCRIBER.

$$H P \left(\frac{d^3 l n s}{10^9} \right)_4$$

When d^3 = square of bore of cylinders in millimeters;

l = stroke in millimeters;

n = number of cylinders;

s = speed of crankshaft r. p. m.:

For the $4\frac{1}{2} \times 4\frac{1}{2} = 108 \times 108$ m/m, approx.

$$H. P. = \left(\frac{108^3 \times 108 \times 4 \times 1000}{10^9} \right)_4 = 20, \text{ approximately.}$$

For the $4 \times 4\frac{1}{2} = 101 \times 108$ n/m approx.

$$H. P. = \left(\frac{101^3 \times 108 \times 4 \times 1000}{10^9} \right)_4 = 17.6, \text{ approximately.}$$

This is on a basis of 1000 revolutions per minute, which is not the maximum power speed. The probable maximum (conservative) speed would be about 1300 r. p. m. You ask for the relative ratings however; hence, the maximum power speed may be disregarded.

KEROSENE IS BETTER THAN NOTHING.

Editor THE AUTOMOBILE:

[1,617.]—I am very much interested in "The Automobile," and look forward eagerly to each new issue. "Letters Interesting and Instructive" are of much value and may be made more so if careful observers will report their experiences. Automobile "doctors" certainly disagree widely and a driver of small experience is at his wits' end to know wherein the truth lies.

Your answer to "A. G. D." about the kerosene treatment for carbon deposits in cylinders would indicate a very limited experience for the writer when he says: "We have never heard any objections to this practice and do not see any cause for them except laxness." I have found it a frequent topic of inquiry and argument when two or three of the elect are gathered. The makers of my car, a four-cylinder, 35-horsepower, advise its use, but their New England road expert (endurance driver and Glidden "godder") says no, and I have followed his advice the last 1,200 miles with good results. Why does a certain decarbonizer advertisement say, "No kerosene"? To me that suggests the existence of an adverse opinion.

As regards decarbonizers, it ought to be known by this time whether they will do the work without injury to the engine. If they have not got it right yet, they will soon have it. One of the oldest and greatest scientific authorities writes me: "We have independent information of the successful use of a chemical compound for the removal of the solid products of combustion deposited upon cylinders and valves of automobiles and similar engines. It is guaranteed not to damage the metal in any way, simply volatilizing the carbon which passes out of the exhaust with the gases of combustion."

Descending hills I cut out the spark and give the engine about all the gas it will take, and have an idea it serves to clean out the cylinders, etc. Is there any efficiency in that? Does it serve any good purpose to apply kerosene along the sides of the springs?

Have tests ever been made to determine how far a given amount of gasoline will drive a car at different speeds; in other words, what is the ratio of increased fuel consumption to increase of speed?

J. H. NETTLETON.

New Milford, Conn.

Irrespective of the incidents in the history of this subject, it is a fact that kerosene oil has been much used in cylinders to avoid evil influences of carbon deposits. One of the companies at one time provided facilities, by way of a tank of kerosene and suitable means, by which the operator of the car could inject kerosene oil into the cylinders at frequent intervals.

Motors so treated seem to thrive and the carbon deposits do not seem to grow in the cylinders. A great many people have used kerosene oil in the cylinders for the same purpose, and the kerosene undoubtedly will creep in behind the crust and loosen

the same from contact with the metal; once loosened, it will, of course, blow out as soon as the motor is started.

If you used a decarbonizer (and the same is efficient for the purpose) it would seem superfluous to employ kerosene oil as well. As to the efficiency of decarbonizers, there seems to be no question at all, and they differ from kerosene oil in that they prevent the forming of any considerable crust, whereas kerosene oil will loosen the crust after it is formed. One is a preventive; the other a cure. Wisdom dictates the use of the preventive, and if the makers of the decarbonizers guarantee that they will not etch the polished surfaces of the cylinders, the guarantee may be taken no doubt, since they are the best judges of what they use and its action on metals.

You can best scavenge your motor on a descent by cutting off the gasoline and allowing a free circulation of air; if you are not equipped to separate the gasoline from the air, the presence of the same will do no damage unless by a "muffler shot" when you switch in the spark. Springs should not have an application of kerosene oil; it is better to jack the body upwards to relieve the springs of their weight, pry the leaves apart, and, with a squirt can, apply oil to the bearing surfaces of them. The leaves are concave, thus affording a space for this oil, and the slippery surface resulting will prevent squeaking, on the one hand, and the unequal distribution of strains on the other; while it is true as well that rust formations will be absorbed.

The fuel consumption will depend upon the wind resistance above 20 miles an hour, and the wind resistance in turn depends upon the front area of the car. Simultaneously with these considerations will be the question of the road condition, as it will affect the mechanism of the car, etc. Below the point at which you have to take into account wind resistance, the fuel consumption will be proportional to the power required to drive the car, if the carbureter is exactly suited to the purpose and if the motor is driven at its most efficient speed, which demands that all speed changes be made through the good office of the gear set.

Having fixed all of these conditions, if you then determine the draw-bar pull of the car (which is not the same for all cars) and the gasoline required per ton mile at that draw-bar pull, the consumption within the limit stated may then be approximated. We have records of tests of this character under conditions of actual practice, but they are of no value whatever excepting in connection with the very car involved.

SOME FINE CARS HAVE WOOD FRAMES.

Editor THE AUTOMOBILE:

[1,618.]—I am planning a light runabout and would like to know if you think a frame built of hickory or white oak would be sufficiently strong to support about 750 pounds and stand the usual road strains and shocks. The car is to have a wheelbase of about 90 inches. Of hickory or white oak, which is the best suited for the purpose? What would be the proper dimensions of the wood for a frame of this kind?

AN INTERESTED READER.

New York.

Either hickory or white oak, if well seasoned and second growth, would suit your case admirably. It is not so easy to fit the dimensions without knowing as to the locations of the laterals. If laterals come well spaced the thickness of the side member can be reduced, and vice versa. As a general statement, we would think the section might be one and one-half inches thick by four and one-half inches deep, and that the side members could be tapered off to three inches at the ends. The iron work will have some to do with the ability of the finished frame, but these are all matters in relation to which you are no doubt already well informed. Ash, rather than the woods you mention, is employed altogether by the makers of the Franklin cars, owing to its great resiliency. It is made in laminated form.

MR. SOREHEAD ON THE CHAUFFEUR.

Editor THE AUTOMOBILE:

[1,619.]—The word chauffeur is a name applied to that species of *genus homo* which causes the benzine-propelled phaetons to climb walls and frighten street cars. This name hails from France, the

cradle of the motor car, and has the literal meaning of "fireman"; many persons agree that this applies to their post-mortem vocation. To be a chauffeur is to rank among "the chosen," as the more earthly of the swarm will deign to inform you; who does the choosing may be readily imagined from the reverent expletives in common use among the leather-clad brethren.

Some few of these reckless road-kings can lay claim to an efficient training in cushion-greasing and lamp-breaking, but the majority wear a tin breastplate labelled "License" only for the reason that Fortune turned over the required fee as the result of a good poker hand. To the uninitiated it would appear that the duties of a chauffeur would be the care and operation of the vehicle in his charge, but in reality his sole obligation is to accept his "salary" from that favored mortal, his employer. When you ask what the owner has to cash up for the privilege of occupying the left front seat, the chauffeur will haughtily assert, as he tucks in his paper collar, "Forty per." But to see him in his glory you must invade the evil-smelling interior of a garage, where in a far corner you may observe one of "the boys" produce an inner tube from his chariot and hand it quickly to a novice owner, receiving in exchange a substantial roll of the pea-green scrip. You may wonder if this is a practical demonstration of graft, but be wise and refrain from inquiry.

In another corner of the shop, a pair of French heels loom up under a front axle, and there is a busy "tap, tap" of a hammer and chisel upon some bolt-head whose spanner had been sold for the price of a hop-soda. Suddenly there is a dull thud and "mid sounds unholy" the hammer goes skimming across the concrete floor, finally taking paint from a wheel freshly painted. The sulphurous vapor is even worse than the richest mixture his ignorance can produce. Compared to this lurid blasphemy the vocabulary of the seafaring tar is but infant's prattle. Pulling your fingers from your ears on a quiet side street, you recall seeing the advertisements giving among the attainments, "three languages spoken." It is easy to realize the advantages enjoyed by an accomplished linguist both in the matter of alleviating pain and in frightening the refractory machine into docility.

While you ruminate upon the peculiar features of this estimable profession, a big car comes up the pike with the latest automobile raiment behind the wheel. As you shrink back against a building, the flying juggernaut dashes for the curb and stops with a heaven-reaching screech one-quarter inch from the back end of a big dray. Your heart stands still as the thing at the wheel rises and stalks toward you. His floating robes seem about to engulf you and his goggle-eyes burn from the devilish racing hood. It speaks: "Say, fellah, yuh ain't got a hell-stick, hev yuh?" Recovering your breath, you hand over your "last" and watch "It" speed away on the high gear from the start. What a creation! Small wonder equines refuse to share the road with such evil-looking goblins. But many of the so-called "mecniciens" require a rather extensive wardrobe to cover their ignorance of things automobile. Would that their gallantry and courtesy also rivalled the ancient knight.

One delightful pastime indulged in by the gasoline fraternity causes more nervous wrecks and loss of weight than sanatoriums and weighing machines can take care of. To get experience in person—or rather body—seek the busiest corner of your city, and when the traffic becomes hopelessly congested, start for the opposite sidewalk. Invariably a big dray will oppose your progress, and you turn back, but—"Honk!"—a steaming foreign radiator punches you smartly in the ribs. Amid the picturesque reprimands of the chauffeur, you weakly drag your trembling limbs to the sidewalk. It avails naught to glare and curse at the receding auto. Be satisfied you are not "pinched" for marring that expensive cooler—the car was only going "twenty" anyway.

The curse of the American highway! Prison stripes for 'em all! Sour grapes? Rot! Why, you wouldn't be classed in that "Auto School" your eye has caught an "ad." of in the paper you're waving about. "\$300 a month guaranteed. Latest French models." Oh, possibly there are a few decent men at the business, and even if there are none, you carefully cut out the advertisement as a means to uplifting the profession.

L. D. F.

Auburn, N. Y.

KENTUCKY WANTS TO SEE THE GLIDDEN TOUR.

Editor THE AUTOMOBILE:

[1,620.]—I am making an effort to have the next A. A. A. tour for the Glidden trophy come down into Kentucky, and it is my suggestion that the tour start from Chicago and the route include South Bend, Kokomo, Ind., Louisville, and Bardstown, visit the Abbey of Gethsemani, Lincoln Memorial Farm, and Mammoth Cave, then by way of Evansville to St. Louis and to Denver. The Lincoln Memorial Farm at Hodgenville will be dedicated as a national park before the 1909 tour. Mr. Glidden writes me that it would afford him a great deal of pleasure personally to have the tour come to Kentucky. "Collier's Weekly," because of its interest in Lincoln Farm, is also interesting itself in having Kentucky included in the route.

CLAUDE W. WILSON.

Bardstown, Ky.



THE Autocar Company of Ardmore, Pa., has entered the field of the commercial vehicle, and has put on the market an entirely new line of cars. Fads and sensations, by the way of new models each year, have been dispensed with, and these new cars, instead of being called 1901 Autocars, will be "Type XVIII" cars, following the policy of bringing the construction to a standard manufacturing basis.

Two styles of chassis have been designed: first, with a long chassis and solid rubber tires; and, second, a shorter chassis, using pneumatic tires. The long chassis is intended for light delivery work with 2,000 pounds load capacity. This chassis can be fitted with open or closed delivery bodies or with a twelve-passenger bus body. The short chassis is intended for passenger work, and can be fitted as a town car, victoria, or station wagon body. For certain chassis of light, quick delivery work it can be fitted with a small box body.

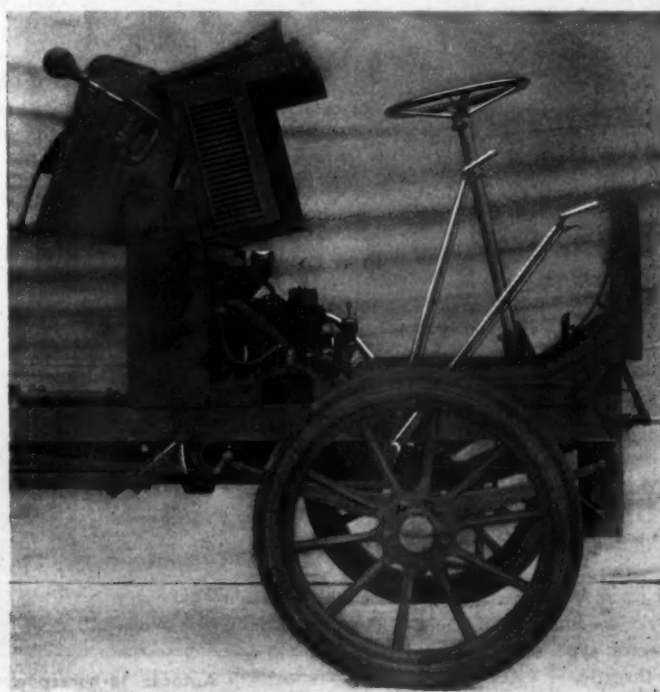
Most Commodious Bodies.—In order to get a maximum size of body on the shortest possible wheelbase, the motor is located under the driver's seat. This seat structure is separate from the body proper, and either can be removed without the other. Accessibility to the motor has not been compromised by this location. Small doors at the side of the seat provide easy access to the spark plugs and valves. The seat itself is hinged, and the whole structure may be thrown back, as shown in one of the illustrations. The motor and transmission case are mounted upon a pressed steel frame, the motor is secured by four bolts, through feet on the sides of the cylinders, and the transmission case by four bolts, through its legs. The removable power plant eliminates the necessity of spare cars in any delivery service, as an extra power plant only need be substituted while repairs are being made on the original one.

Some Power Plant Features.—The motor is of the two-cylinder opposed type, 4¾-inch bore by 4½-inch

stroke, and is rated at 18-horsepower (A. L. A. M.). The cylinders are of a fine grade of grey iron, rough bored, annealed, finish bored, ground to size, and finally lapped in with pistons and rings. By means of this method of manufacture a perfect fit is assured. The valves are both on the upper side of the cylinder, and can be readily removed. They are both mechanically operated from the same camshaft and are interchangeable. The valve heads are of such shape that warping is reduced to practically zero, and that in case of a valve head cracking it cannot enter the space traversed by the piston. The pistons are of the same grade of grey iron as the cylinders, and are accurately ground to size before the lapping operation. They are fitted with three 5-16-inch piston rings, all located above the piston pin. The piston pin is hardened and ground to size, and is held in place by means of a "snub" and spring. The connecting rods are of high carbon steel, drop forged and heat treated. The piston pin and crank pin bearings are of bronze. The crank pin bearing is adjustable, the cap being held in place by means of two 9-16-inch bolts. The crankshaft is also of high carbon steel, drop forged and heat treated. All journals are accurately ground to size.

The crankshaft is mounted on extra large Hess-Bright ball bearings of the silent type, and carries two flywheels, one on each end. The front flywheel has fan blades cast in it. In the long chassis this flywheel carries a throttle governor which limits the speed of the motor to 1,300 R. P. M. The rear flywheel carries the clutch.

The crankcase is split horizontally into two parts. The lower part carries the cylinders, crankshaft, water pump, and camshaft, while the upper part carries the push rods and guides, the magneto, the oiler, and a gear for driving the water pump. This part of the case is easily removable, carrying its parts with it, and giving access to the crank pin bearing, without dismantling the motor. The magneto is standard equipment, and is attached to the top of the crankcase by

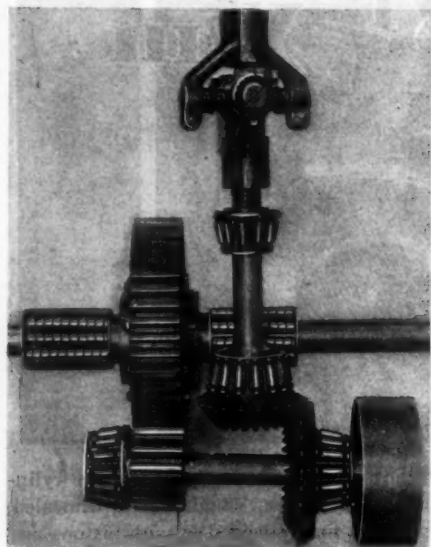


Showing the Accessibility of the Autocar Power Plant.

means of two winged bolts. It can be removed and replaced without altering the timing. This magneto is of the low tension type, delivering its current to an induction coil, mounted on the side of the seat structure. Thus, a dual system of ignition is provided. The oiler is of the force feed type, and delivers the oil, through a sight feed, to the crankcase, whence the cylinders, camshaft, crank pins, etc., are lubricated by splash.

The oiler is held in place by a single winged bolt and dowel pins, secure, and at the same time easily removable.

A Very Satisfactory Transmission.—The clutch is of bronze, floating ring provided with cork inserts. The forward end of the clutch shaft is centered in a bearing in the rear end of the crankshaft. The transmission is of the progressive sliding gear type. The countershaft is located below the



Rear Axle Double Gear Reduction, and Roller Bearings.

main shaft; all shafts rotating on Timken roller bearings. The case itself is cast in one piece, with two hand-hole openings. The hand-hole opening permits the adjustment of the gear shift fork. The sliding train operates on the squared main shaft, and provides three forward speeds and one reverse, high speed, direct drive, through the transmission.

The power is transmitted from the gear case to the rear axle through two universal joints and a drive shaft. The rear axle contains a double gear reduction. The bevel pinion, connected at the end of the drive shaft, drives a large bevel gear on a short transverse jackshaft. From this shaft the drive is transmitted to the differential housing by means of a pair of large spur gears. The bevel pinion shaft and jackshaft run on Timken roller bearings, which are mounted in caps, screwed into the axle housing. One of the jackshafts extends through this housing and has the emergency brake drum mounted on it.

Axles, Wheels and Control.—The live axles are heavy, and are provided with squared ends. The square on the inner end slips into the differential gear, and it, on the other end, drives the wheel which is secured to it. These axles are mounted on Hyatt roller bearings, at their inner ends, and on Timken roller bearings, at their outer ends. The thrust of the wheels on a curve is taken through the two axles to the Timken bearing on the inner side of the curve. The axle housing is of malleable steel throughout, and is in five pieces. The spring seats and brake supports are integral with the tubes, and no parts are riveted.

The front axle is tubular with the Elliott type of steering knuckles. The spindles carry Timken roller bearings, on which the wheel hubs are mounted. The cross-link, connecting the two knuckles, is in front of the axle, and the steering link lies transversely across the car, connecting the steering gear arm to the knuckle arm on the opposite side. One foot pedal controls the clutch and the other the service brakes on the hubs of the rear wheels, while the side hand levers control the gear shift and emergency brake. When the brake lever is applied the clutch is automatically released before the brake tension is noticeable. The steering gear is of the bevel and sector type. Two short levers above the wheel control spark and throttle.

The Armored Wood Frame.—The frame is of armored wood, constructed of pressed steel channels, reinforced with wood members. The front springs are semi-elliptic, and the rear springs are full elliptic.

The wheels are of the artillery type and constructed from selected hickory. On the short chassis they are equipped with Goodyear detachable rims and 32x4 pneumatic tires, and on the long chassis with 32x3½ solid tires. The short chassis has a wheelbase of 85 inches, accommodating a body platform 48 inches wide and 68 inches to 90 inches long if so desired. The long chassis has a wheelbase of 97 inches, accommodating a body platform of 48 inches wide and 80 inches to 100 inches long.

WINTON SECOND "UPKEEP" CONTEST BEGINS.

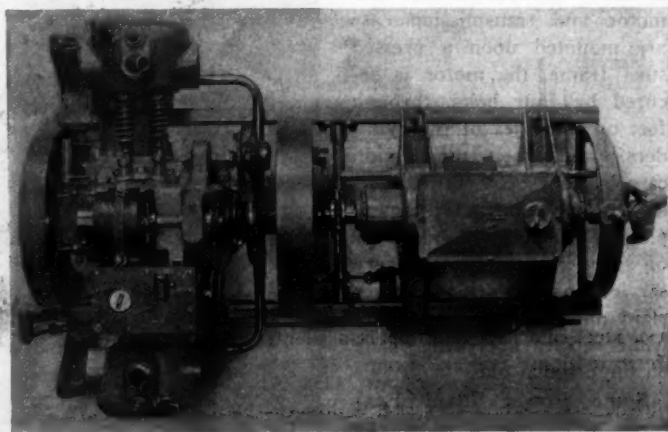
The second annual \$2,500 upkeep contest for Winton "Six" chauffeurs opened November 1 and will continue to June 30, 1909. Contestants must be employed drivers of Winton Sixes, any model, and will be required to file monthly reports of mileage and expenses. At the end of the contest these reports will be passed upon by a committee of disinterested judges, who will award the cash prizes. The chauffeur making the best service record will receive \$1,000. Second prize is \$500, third \$250, fourth \$150, fifth to tenth \$100 each. There is no entrance fee.

It will be recalled that the ten winners in the first annual contest drove their cars 65,687.4 miles on an upkeep expense of \$15.12, an average of \$1 for each 4,343 miles, or less than 25 cents for each 1,000 miles—unquestionably a world's record.

"We are reaching the point in the automobile industry," says Mr. Winton, "where upkeep expense is of cardinal importance to buyers, and we propose to prove by these public tests—all records open to every interested person—that Winton Sixes are the best investment the market affords. Low upkeep expense signifies more than absence of repair bills—it means continuous, satisfactory service, because the car that encounters repair bills is also a car that disappoints its owner in the character of its performances."

FAVORABLE CUSTOMS RULING ON FORGINGS.

It has taken the Board of United States General Appraisers just two years to decide that drop forgings are forgings and should be admitted as such when imported from abroad. Thomas Prosser & Son, New York agents for the Krupp firm, have been importing connecting rods, crankshafts and similar parts made by the drop-forging process, and the government decided they were "manufactures of metal," accordingly assessing them 45 per cent., instead of 35 per cent., which is the duty on "forgings." Two years ago, a sub-board of appraisers reached the same decision, but the question was then taken out of its jurisdiction and litigation extending over the interim has been necessary for the general board to determine the merits of the question of whether a piece of metal that has been die-forged is really a forging.



Autocar 18-horsepower Power Plant for 1909.



THE illustrations will show better than a word picture, the symmetry and strength present in the design of this bidder for utility favors. In commercial work, involving unskilled labor more often than not, the power plant is of the utmost importance, and in connection with this truck, an effort has been made to so perfect the several features, as to eliminate the squirt can, the screw driver and the monkey wrench.

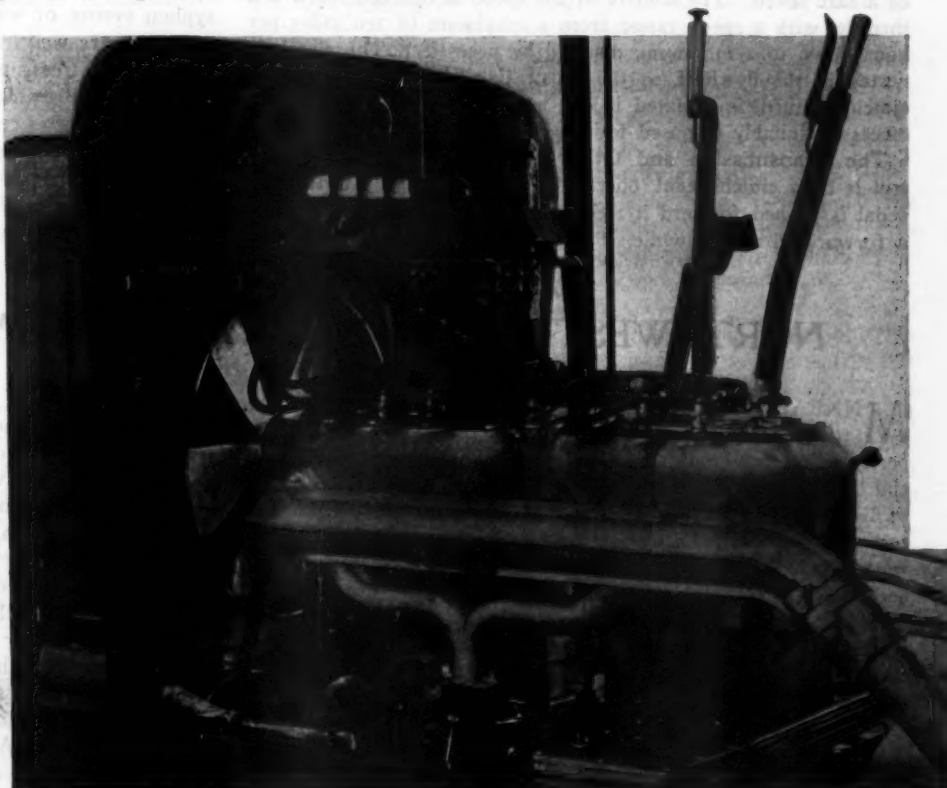
Motor Characteristics.—The motor is of the four cylinder type, conventional four cycle, 5 1-2 x 6 1-2, bore and stroke respectively and is rated by the makers at 60 horsepower. The cylinders are cast in pairs, water cooled, with integral head and this difference, i. e., the heads of the water jackets are separable. This construction permits cores to be properly centered; the complete removal of core sand, and, after cleaning, if the occasion in service should require. The pistons are long, packed with four concentric rings, with intervening oil grooves, while the cylinders and the pistons are of a special close grain iron. The crankshaft is of nickel steel, forged and "slabbed" and after profiling is machined with an allowance for grinding. For the connecting rods drop forgings are used, the same of a special grade of toughened steel, while the wrist pins are hollow, hardened and ground.

Realizing the arduousness of the service and the lack of attention the plant will be given in the ordinary run, the projected area of the respective bearings is greater than that likely to be found in other branches of service and sufficient to assure long life and the absence of annoying, if not costly, interruptions. The valves are large with special nickel steel heads and carbon steel stems in long guides. The cams are separable on a special steel camshaft and impart a silent, uniform motion. The half-time gears are separately housed, which housing in turn is packed with grease. The water circulation is by means of a gear-driven centrif-

ugal pump, while the cooler is adequate in point of capacity to abort steaming. Lubrication is by splash with suitably devised oil ducts and troughs, assuring a slippery surface and a profusion of the oil supply at every zone of pressure. The ignition system consists of a magneto on the valve side of the motor, with an auxiliary battery and spark coil system for cranking, and if the magneto fails, which, however, is a remote contingency, there are other nice features in connection with this power plant, as for illustration, the exhaust manifold is of large diameter and separably flanged, moreover, the intake is designed with a view to a continuity of the flow of gas and is separably flanged, and we might say, before departing from the subject, that there is a certain nice symmetry about these features that extends beyond utility and pleases the eye.

Transmission System.—Beginning with the clutch, it is to note a multiple disc type, housed in the flywheel, the numerous discs submerged in oil, backed by ample surface, assures a continuity of the clutching functions. From the clutch, the propeller shaft is short, and is terminated in a universal joint at both ends. But there is no perceptible angularity of the transmission, hence the joints are required to do no more than to transmit the power and take care of mere deflections. The transmission set is of the selective type with chrome nickel steel gears, from materials by "Krupp," and an assurance of life, aside from nice material, come by way of a coarse pitch of the teeth and a wide face of the gears. Flanging is resorted to wherever possible, as for illustration, the flywheel to the crankshaft and the bevel gear to its shaft.

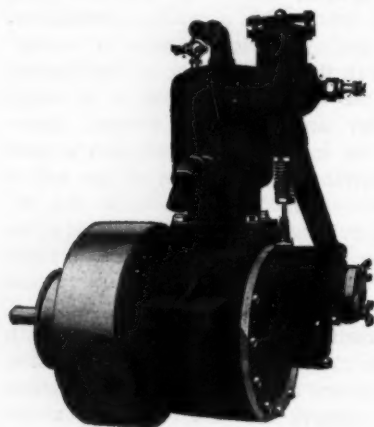
The truck is the product of the Rapid Motor Vehicle Company, of Pontiac, Mich.



Power Plant of the Rapid 5-Ton Truck as Seen from the Left Side.

THE AUTOMOBILE FOR JUVENILES COMES AT LAST

A NEW company has been started at Newark, N. Y., styled the Omar Motor Company, to build the "Browniekar," a car suitable to place in the hands of youthful autoists. An inspection of the illustration showing the car, will indicate that it is a very graceful little automobile most comfortably arranged,



Motor of the Browniekar.

and sufficiently racy in appearance to send a thrill of pleasure through the hearts of juvenile auto aspirants.

Besides affording a real car, with an actual power plant, and all the facilities of an automobile, the designer very cleverly kept uppermost in mind the need for simplicity, on the one hand, and safety on the other. The car is very light, hence the impact, should it collide with an obstruction, will scarcely

be felt at all. The mechanism is accessibly situated, and a good deal of thought has been given the details thereof, rather with the hope that repairs will be a minimum, yet easily effected, should the occasion require.

The Power Plant Complete.—The motor, it will be noted, is of the single cylinder, vertical type. As will be noted it is of the water-cooled genera, with integral jackets, mechanically operated exhaust valves, while the inlet is automatic. Care has been exercised not to overpower the car, but rather to provide a harmonious relation of the power of the motor to the weight of the car, in view of a safe speed. The control of the speed is through spark and throttle, with a speed range from a maximum of ten miles per hour down to a minimum, dictated by necessity. The clutch is nested in the flywheel, as the illustration plainly shows, which clutch, in turn, is actuated in the usual way, through the good offices of suitably disposed foot pedals.

The Transmission and Other Features.—The speed control is by a clutch pedal, operated by the left foot. When this pedal is pushed forward it tightens a belt and drives the car in a forward direction, while, if the pressure is relieved, the belt

slacks. A second pedal, operated by the right foot applies the brake during the interim of slack belt and stops the car. With the idea of illustrating something of the efficiency of the transmission, the designer of the car states: "The car will make from thirty to fifty miles on a gallon of gasoline, while a gallon of cylinder oil will serve during a period represented by from five to six hundred miles of travel."

The Body Work and Finish.—The body is of metal, roadster type, with metal mudguards, and a bonnet of the same material. The finish is what the designers style "medium red, with a black stripe." Oil, sidelights and a tail-lamp are shown, the steering wheel tilts at a rakish angle, and the general appearance is brought up to a high standard. The approximate weight of this car is some three hundred pounds, which is brought about



The Browniekar—An Auto for the Younger Generation.

by divers economies of design, taking advantage of the thermosiphon system of water cooling, and such other modes of procedure as are well known to designers of skill. The builders of this car lay stress upon the particular features, viz:

- (a) The "Browniekar" is an automobile possessing all the usual functions as respects power and control.
- (b) Its perfect simplicity and harmonious relation of parts indicates economy of maintenance.
- (c) An eye to safety in the hands of juveniles was considered first, last, and all the time.

NORTHWEST WANTS AND IS BUYING AUTOS FOR CASH

MINNEAPOLIS, MINN., Nov. 2.—The most noticeable thing to be heard among the dealers in this territory, is prosperity. The reason is the abundance of money in the vicinity, and the readiness of people not heretofore in the market for cars to listen to the arguments of the dealers. Judging from the recent activities of Eastern factory representatives, the Northwest will at last be accorded that recognition for which it has been fighting for several years past. The recent panic and the subsequent showing made by Minneapolis and surrounding towns seems to have caused an awakening among the Eastern manufacturers, who now seem to realize that territory with acres and acres of good wheat land working to bring in the money, with wheat a dollar a bushel, is worth of the closest attention.

Vic Syromquist, for years identified with the Packard interests in this city, has closed with the Corbin people and for the present is located on South Sixth street until his new garage building on "Motor Row" is completed. The Corbin car is

fairly well known in Minneapolis, although it had not had active representation for some time. Stromquist has a roadster demonstrator and expects to be able to make early deliveries.

Kemp Brothers have closed with the Brush runabout and have begun receiving them in carload lots. This firm is also carrying on negotiations for a line of higher priced cars.

Harvey E. Haynes, brother of Mayor Haynes, besides the Welch car, has closed with the Pennsylvania people and is looking for quarters in the neighborhood of "Motor Row."

The Fawkes Auto Company, handling the Rambler and Overland, have added the American to their list and have commenced taking orders right from the start.

An evidence of the general Northwestern prosperity is the fact that the Pence Auto Company, selling the Stevens and Buick lines, have placed an order for 1,800 (eighteen hundred) cars for the coming season. This includes the runabout and buggy types of Buicks and the Stevens touring car.

USEFUL THINGS FOR THE AUTOIST TO KNOW

THE proper lubricant for the bearings of the water circulating pump is a stiff mineral grease similar to vaseline. Grease containing animal fats softens considerably under heat, and is melted by the water and carried through the circulating system. Mineral grease, on the other hand, retains its consistency up to fairly high temperatures and is also very much better adapted for this use than other grades. A good grease will frequently serve to keep the pump from leaking where the packing is no longer what it should be and tightening the gland nut is of no further avail.

Feeding Mineral Grease to Bearings.

The theory of the behavior of mineral grease when used as a bearing lubricant is essentially different from that of animal grease. The latter is applied under more or less pressure, but much reliance is placed on the fact that it softens under heat, and indeed runs like oil if the bearing is hot. Mineral grease, on the other hand, does not soften materially under like conditions, and therefore it must be fed to the bearing by steady pressure; preferably by a spring grease cup. As there is obviously a limit to the distance the grease cup will transmit its pressure along the shaft, it follows that the shaft should not extend more than 3 or 4 inches either way from the grease cup, unless it receives an additional supply of lubricant from another grease cup, or from oil, as is the case with some gear shaft bearings. Whether a bearing be lubricated by grease or oil there should be opportunity at each end of the bearing for "stale" lubricant to escape. The same principle applies to a long shaft bearing fed with grease from cups located some inches apart. In other words, an outlet should be provided for the grease midway between the two cups as well as at the ends of the bearing.

Attaching Coil to Metal Dash.

When a heavy spark coil is to be attached to a metal dash, especially an aluminum dash, it is necessary to distribute the weight of the coil over as large an area as possible. If the coil were simply bolted through the dash by four bolts these bolts probably would work loose in the aluminum in time and enlarge the holes through which they passed. In addition, the overhanging weight of the coil would tend to bulge the aluminum around the nuts belonging to the upper bolts. To make a stiff and durable job, the bolts should go through vertical strips of hard wood not less than 1-4 inch thick and 1 1-2 inches wide. These strips should go on the front of the dash and serve to distribute the pressure of the nuts and washers over a considerable area of metal. It may be necessary to have the same strips extend above and below the coil and have additional bolts put through their ends. In that case, leather washers should be used in addition to the metal washers under the heads of the bolts.

End Play in Steering Gears.

A set screw is useless to take the end thrust of the steering worm or the worm gear, and it concentrates the pressure too much. In many steering gears, slackness due to wear is found to a much greater extent in the end play of the worm and segment than in the worm teeth themselves. The only way to make a durable job in taking up end play is to use hard steel washers or discs as large as possible, and provide passages for oil or grease to work across their surfaces. If it were not for the difficulty of cutting it to shape, the blade of an old saw would make excellent thrust washers for this purpose.

Induction in Spark Plug Cables.

Irregular firing, which persists in spite of the utmost care in insulating the circuit and making perfect connections, is sometimes traceable to mutual induction between the spark plug cables, when the latter are several feet long and run side by side close together. The sparks from such induced currents may be as much

as 1-8-inch long, and when the mixture is just right it may be ignited by such a spark near the end of the suction stroke. Misfiring of this nature is infinitely more puzzling and demoralizing than that due to simple failure of the spark. It does not always occur when the plug cables run parallel, but appears to be more marked with battery than with magneto ignition, though this statement may need to be qualified. It is also more marked with certain mixtures than others. The remedy is simply to run the cables at least an inch apart. In this connection it may be remarked that when the current supply is small trouble may be experienced with long cables owing to their static electrical capacity, by virtue of which they must first be electrically charged before they will deliver a spark at the plug. A cable may be so large and long as to absorb the whole charge and deliver no spark at all. A third possible source of loss in efficiency is unnecessarily large or sharp pointed metal objects in the high tension circuit, such for example as large binding posts, wing nuts and stray ends of wire. A high tension charge tends to escape into the air from any sharp metal point in its circuit, and objects such as binding posts absorb the charge on their surface exactly as a long cable does.

Starting in Cold Weather.

A handy kink for starting in cold weather, which is less known than it deserves to be, is to warm the cylinders by squirting gasoline into them and firing it with a match at the compression cocks. A few drops of gasoline in each cylinder is all that is necessary, and the match is held to each open compression cock in turn. The resulting small explosion imparts just enough heat to the walls so that, after the crank has been turned twice to expel the burnt gases, fresh injections of gasoline will evaporate and ignite at once on turning the crank. Obviously, before resorting to this device, one should make sure that there is no stray gasoline vapor about, such as might be due to excessive and fruitless priming of the carbureter, as this would be quite apt to lead to unlooked for and somewhat disastrous consequences, and the driver who does not regard the presence of oil and gasoline splashed over the motor promiscuously had better taboo this expedient. Lubricating oil absorbs gasoline to a certain extent and is then more inflammable.

Starting in Snow or Soft Earth.

Certain materials, such as snow or soft earth, sink under the wheels when the car stands for some time, and it is difficult to climb the minute but steep gradient thus created. A steam car can very easily be extricated from such a position simply by seeing it back and forth, going a little further each time until the "grade" has been so eased off that it is easily surmounted. This trick is simple with a steam car because the throttle can be left open and the reversing lever rocked back and forth. With dexterity, however, a gasoline car having planetary drive, and suitable arrangement of control levers, could be manipulated in much the same way; and with a very easy gear change and gentle clutch it might even be possible with standard sliding gear transmission.

A Possible Cause of Carbureter Flooding.

A possible, but seldom thought of, cause of carbureter flooding is the float striking the top of the float chamber before the float valve closes. This might happen from defective design, from a drop of solder added to the top of the float to raise the gasoline level, or from some accidental cause such as wear of the float valve needle. If the float valve levers reach the limit of their movement before the float valve closes the same effect will be produced. The only sure test for this is to expose the top of the float or the float needle and feel of the needle to see whether or not it is seated. If it appears to be seated, feel of the float and the float levers to see if they have a little further movement.

A Hold-Up in France

THERE are no France. But kinds of *contra-* you may be an un-French law pre-whether it is for maiming of a scratching in the road—until he proves his innocence. The perhaps innocent victim has no chance if he gets the least rattled, or is not a good witness in his own behalf.



By Francis Milfoun.

police traps in there are various *ventions* to which knowing party. sumes one guilty—murder or the crazy chicken middle of the

The automobilist who makes a *contravention* in France may not be aware of it for six weeks, when finally a local *com-missaire* hunts him up and hands him a paper (and takes his receipt for it, too) saying that at a certain time, a month or more back, a hundred, two hundred, or five hundred kilometres from where you now are, you smashed into a rush bottom chair which some imbecile left in the road by the curb; the chair fell over into a basket of eggs; the eggs were broken and now it is a question of your proving that it wasn't you at all who did the thing, but an automobile bearing another number registered in a department away across France. These *facts* count for nothing in the present stage of the game; you must see it through.

Even to a cock-sure gendarme, 837 M looks amazingly like 384 W, even when it comes to making oath on it. And the proof is up to you to prove that your automobile was in the repair shop at the time awaiting a new valve seating, which the factory wanted two months to supply, it being an ancient model and they being so busy thinking up more changes in design, which they can spring on an unsuspecting purchaser next year and so cause more annoyance of the same kind. There is one factory in France which, with only eight models manufactured to date, carries a stock of something like a million *pièces de réchange*, and the writer knows of another who in half a dozen years has put out a score of models and never has a piece that will fit any but the latest in stock. For the moment we assume that your car was one of the former (the writer knows, he had one of the same breed once), but the *judge de paix* knows nothing of this, and a sixty-cent-a-day gendarme is to him more worthy of belief than you who pay as many dollars a year into the French exchequers as taxes, even though you are a foreigner.

Again, you may get hauled up on the spot—if, for instance, you butt into a donkey and its cart, turning about in the middle of the street at its master's call from the opposite curb. This is a repetition of an incident which once occurred to the writer. In fluent, if not grammatical French attention was called to all and sundry to the true fact (a photographic film was exposed, even in order to have a silent witness, one that would tell no more than it was asked to tell), but no good came of it. A gendarme strolled by, haled you off to his brigadier at the Gendarmerie, and a *procès verbal* followed as a matter of course.

No, there are no police traps in France, but you get badly stung every time you have anything to do with those high-salaried gendarmes nevertheless. The gendarme of the average country town in France, of five thousand or more inhabitants, has a jolly time of it every Sunday morning. He saunters out spick and span, as proud as a peacock, takes his stand on a busy corner, and watches out. He picks out some poor unfortunate automobilist who stops to ask his way and demands to see his "*papiers*" (you must have them on your person, always, in France). He would like to have a look at your *Certificat de Capacité* and the receipt for your last taxes, if you please. Of

course, you do please, and if you have not forgotten them and left them in the trunk which you sent ahead by *petite vitesse* you show them to him. If you have them all, well and good; if you haven't, why, *procès verbal*; the mere fact of the confection of which will cost you a franc, even if you are proved not guilty. Red tape is costly in France as elsewhere once it begins to unwind.

If you are a stranger from abroad, stopping by the roadside to admire the scenery, perhaps to spend some of the money you have brought with you for gasoline or oil, or perhaps even food and drink—all for the benefit of the native shop and hotel keeper—the case for the gendarme is not far different. All automobilists look alike to him in great coat and goggles. When he actually discovers you are a stranger in a strange land, he thinks he can frighten you in earnest. He is not a grafter, though, the gendarme in France, there is that to his credit. He is not like the up-State constable in New York or the Kent and Surrey bobbies of Britain, but his brigadier sends him out periodically to make what captures he can, just so that the record book of the "*Maréchal de Logis*" shall not remain a beautiful blank. Promotion in the gendarmerie depends upon activity, not upon efficiency.

If the stranger automobilist in France has provided himself with his "*Carte Rouge*" and his "*Carte Gris*" and has his *numero* well displayed he has nothing to fear. But he must not talk back to the white-braided man of the law; this of itself is a punishable offense. The gendarme in France is, in one respect, like his American and English brothers. He seldom if ever has had personal experience of automobiles, and he is no judge of speed. He can be educated by being given a ride once and again. The writer has done this in several instances in various parts of France, and it is the same old story over again. When you are doing about your prettiest without racking your motor to pieces he immediately wants to know if that is as fast as it can go, and he is as wrathful as you are at a donkey cart which gets out of the way only too slowly. He invariably says hens and chickens and geese and dogs and sheep (except when the latter are going from one pasture to another) have no rights on the road, and you can run over them if you like for all he cares. This is what he says when he is riding beside you, but professional dignity prompts him to take another view if some peasant takes exception to your having decimated a scrawny hen of which he is the owner. As for hold ups for speeding, there are very few of these in France; they exist here and there and for more or less temporary periods, but in general, so far as the open country is concerned, you may make what speed you like so long as you don't run into somebody or something. Then, look out, *procès verbal* this time sure!

PACKARD IN PARIS IN LARGER QUARTERS.

PARIS, Oct. 25.—Present quarters proving altogether inadequate for growing needs, the Packard Paris branch called in the removal men this week and transferred their establishment from the Cité de Puy to 177 Boulevard Pereire, further in the automobile district and more easily accessible from the central part of the city. H. D. Wilson, the Paris agent of the Packard Motor Car Company, reports that the number of cars of their manufacture visiting Europe this year is larger than ever before.

Though requests for repairs are always light, it was considered necessary by reason of the number of callers for information and assistance to seek more suitable quarters. The only reason for founding the Paris house was to be of assistance to Packard tourists in Europe; thus, at the new establishment a complete stock of parts is maintained in readiness for shipment at a moment's notice, and a repair shop is at the disposition of those who may need it. The increasing number of Packard cars which traverse the Atlantic each year and undertake trips of several months' duration through Europe substantiate the claims which are made for the company's product.

Autoing Conditions in Buenos Aires

By Sigmund Krausz

It takes patience and *savoir faire* to get an automobile out of the custom house in the capital of the Argentine Republic. Why it should be so is quite inexplicable, for there have arrived here a goodly number of automobiles. But everything down here seems to be arranged in a manner to benefit the "despatchandos," as the customs brokers are called, and the host of graft-seeking custom house employees who are in a position to be arbitrary. However, this condition is not different from that of the other South American countries I have visited so far, and one gets, by and by, used to the system.

Before speaking of automobile matters in general, I would like to advise other Americans coming down here, either for the purpose of establishing business connections or for pleasure autoing, to be even more careful in the matter of selecting garage accommodations than is necessary in Uruguay or Brazil. The city is full of dealers and chauffeurs interested in the promotion of foreign cars, and, unless you take the greatest precautions, the owner of an American automobile will soon find his automobile cutting the most extraordinary capers—if it remains in a condition to cut capers at all. I cannot make any direct accusations, but since the fact absolutely exists that American cars returned in first-class condition to garages after an afternoon's run have been found next morning "on the bum," and that if a repair is really needed it takes an eternity to have it done, one may draw his own conclusions.

These facts were admitted to me by the owner of the garage where I keep my car, and I have made him—as a condition *sine qua non*—responsible for any inexplicable mishaps while the machine is in his place. Withal, I have also taken the precaution of hiring a compartment which can be locked, and am also careful enough to secure the safety of the motor by fastening down the hood by means of padlocks. Thanks to these precautions, my Stoddard-Dayton is performing in Buenos Aires with its usual reliability.

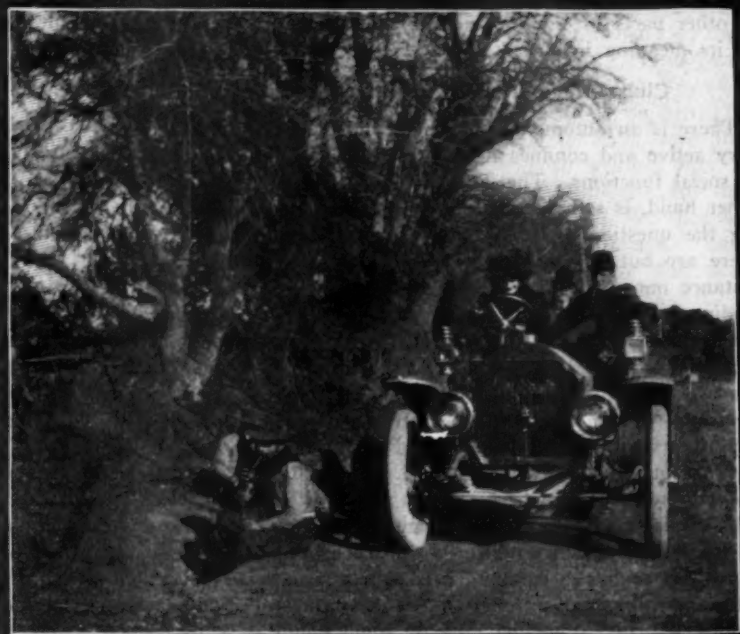
There is another thing to which I would like to call the attention of such American manufacturers who have a well-known car and wish to introduce it in the South American market, especially in Argentine. It is the matter of registering the name or trademark under which a car is sold. Without this precaution it may happen—as lately two American concerns have learned at their expense—that they see themselves in a position where they cannot sell their own product in Argentine without coming to an understanding with some blackmailer, who has registered either or both of them in his own name. There is no law that will protect the rightful owner of a name or trademark, unless he registers them before working. Since the cost is not great, one may save a lot of trouble by the procedure. The protection is good for ten years and may be renewed.

Autoing the Rage in Argentina's Capital

Buenos Aires has seen within the last two or three years a remarkable growth of the auto fad, but the financial stringency of the last half year or so has put a considerable damper on the auto enthusiasm. There are at present, according to various estimates, from 1,000 to 3,000 automobiles in the city. The latter figure is evidently much exaggerated, but it is quite safe to put the number down at about \$1,500. Many of these, however,



Park of Palermo, Buenos Aires.



A Country Road in Argentina.



Buenos Aires taxicabs.



Street in San Isidro, Argentine.

are out of running on account of economic restrictions and the disgust of owners with the irresponsible and rascally class of chauffeurs which predominate. There are very few Argentinians who take the trouble to learn anything about the construction of their machines, or even to drive them, and, consequently, they are entirely at the mercy of any chauffeur who is in league with garages and repair shops. An Argentinian rarely buys a car for the love of sport, but simply for show. If his friend or neighbor has a fine car, he must, of course, if he can afford it, have a finer one. This is the reason why one sees such a large number of luxurious limousines and landaulets of the best makes in the streets, and they are, sometimes, of a horsepower entirely out of proportion with the requirements of the local topography.

The city is absolutely flat; the streets, though narrow, are well paved and touring in the country is, on account of the lack of roads or their abominable condition, largely out of question. These conditions may improve in time, but it will take considerable time, for "*manana*" is here the word, as well as in other parts of South America, even if not to the full sense of its meaning in Brazil.

Club Life and the Roads in the Vicinity.

There is an automobile club here, but it does not seem to be very active and confines its efforts principally to the promotion of social functions. The Touring Club of Buenos Aires, on the other hand, is somewhat more energetic in the way of furthering the question of road improvements. At the present time there are but few roads on which one may venture for some distance out of Buenos Aires, the best of these being the one leading to a resort called Tigre. It is of about 25 miles length, but the latter part of it, the stretch after San Fernando, is not exactly what one would call a good, or even a fair automobile road. Going in the Tigre direction one comes, after leaving Belgrano, over a five kilometer stretch of fine macadam road. This is a road specially constructed for the use of automobiles. It is about 20 feet wide, is fenced in with barbed wire, and is about the only place where one can speed with some safety.

There is talk just now of arranging a race, but unless it be a steeplechase or an endurance run, I cannot see where such an event could be held. Three horse race courses provide sufficiently for hippic sport in the Argentine capital, but conditions for an automobile race of some importance are as yet in the embryo.

It is a pretty sight, especially of a Sunday, to see the long lines of fine autos out in the park of Palermo. There the fashionable world gives itself rendezvous, and while the private and livery carriages outnumber by far the autos, the latter are certainly there by the hundreds. The aspect reminds one forcibly of the Bois de Boulogne in Paris, and when the lines drive back to the city between 5 and 6 o'clock in the evening the Avenida Alvear is almost as crowded with vehicles as is the Avenue des Champs Elysées at a similar hour in summer. One may see then, in letting the automobiles pass review, all the famous makes of France, Italy, Germany and England, but very, very few of American origin. I am quite proud to say, however, that my 40-45 horsepower Stoddard-Dayton touring car caused quite a sensation among the connoisseurs during the corso in Palermo. They begin to call it here, "*El diablo gris*" (the gray devil), and it is opening the eyes of the natives to the possible merit of American cars.

The Street Sprinkling Man is Ever Present.

Speaking of the corso in Palermo, I must mention the nuisance of sprinkling the roads and streets that lead out there. I call it a nuisance because it is overdone. You may drive out at any hour of the day, by sunshine, cloudy weather, or even after a rain, and you will find the sprinkling fiend at work with hose wagon or even sprinkling can. No wonder all motor cars in Buenos Aires are fitted with "*antiderapants*," and it is a pity that the horses of the city cannot be equipped with a similar

contrivance. For it is not only on the wide roads running to Palermo that the sprinkling fiend is busy. No, even the asphalt-paved narrow business streets are made almost impassable for draft animals by continuous watering, and on all sides one may see horses slip and fall down.

While I feel compelled to mention this asinine sprinkling nuisance, I am obliged at the same time to acknowledge with gratitude the good treatment I have received at the hands of the city authorities in relation to a driving license. On producing at the "*intendente's*" (mayor's) office my journalistic credentials, I was quickly granted a special license for 15 days, with the privilege of renewing it for a similar period as long as I stayed in the city. I was not even given a temporary number, and I have been driving about town unmolested by the police, who do not even seem to notice the lack of a number on the car.

The municipality has, however, taken lately some drastic measures relating to the driving of cars within the city limits. The chauffeur's examinations are to be more severe than hitherto, young men under eighteen are not allowed to drive cars of higher horsepower than eighteen, and among other things acetylene lamps are forbidden at night. I mean to say, the lighting of them. This measure I regard a good one, in view of the fact that the city is well lighted. The driving is regulated by arrows on the street corners, pointing in the direction in which traffic is to move, and since there are but few streets in the city where vehicles can move in both directions, one has to know the town pretty well in order to avoid detours.

Plenty of Good Garages and a Taxicab Service.

There are a large number of livery garages here and several companies have auto taxicabs for hire on the streets. All these are of a collapsible landaulet type and of French manufacture. At this time of the year—it is winter now down here—they circulate with closed bodies. In this connection, I cannot refrain from mentioning the curious fact that horse-driven passenger vehicles for hire on the stands must be of the open kind. No hansoms, closed cabs or carriages are allowed, and no matter how the weather is—sometimes it gets deucedly cold here—the passenger has to face the biting pampero winds in an unprotected vehicle. There are no lap robes, either, furnished by the Buenos Aires cabby, who, by the way, is a far better man in his line than his chauffeur brother.

In order to secure adequate legislation, to improve the general character of chauffeur's and mechanic's service, and to promote the interests of dealers and garage proprietors, the "*Sociedad Union Commercial de Automoviles*" has lately been formed by a combination of importers, livery garage owners and accessory dealers, which promises to become an important factor in the automobile business of Buenos Aires. This association also has the sympathy and support of all private owners, and it is hoped that the object desired will be achieved. As it is, the business is certainly demoralized here and needs some energetic measures and unity of purpose to bring it back to normal state.

Ware Switzerland! is the advice of A. A. Anderson, an American, who is taking the cure at Ragaz with his wife, gives his compatriots, and it seems that he really has cause to say the same. He set out with Mrs. Anderson for Zurich and thereby exceeded the terrible pace of six kilometers an hour, the limit set. This he does not deny, and, in fact, it would be difficult for anyone to keep within its bounds. At any rate, he was caught, and at Mels he had to deposit a sum of 100 francs. At Flums, after the wires had played, he was brought before the judge, and, after a long discussion, he had to pay a fine of 45 francs, the remainder of the sum being returned to him. It was while here that the incidents occurred of which Mr. Anderson so justly complains, for, during the many hours of waiting, both he and his wife were gravely insulted and even set upon by the population.

HOW THE INTERNATIONAL RULES WERE ADOPTED

PARIS, Oct. 25.—Next year's international racing cars must not exceed 130 millimeters (4.26 inches) bore for four cylinders, and must weigh not less than 900 kilos (1,984 pounds). Six cylinder engines will be allowed a bore of 106 millimeters, and the same minimum weight of 900 kilos. Motors of the Gobron type, two pistons per cylinder, will be admitted. These decisions being arrived at by the International Association of Recognized Automobile Clubs, will be in vogue for all the great speed contests of 1909, including the Grand Prize of America, and, if Britain decides to hold another speed contest, for that country also.

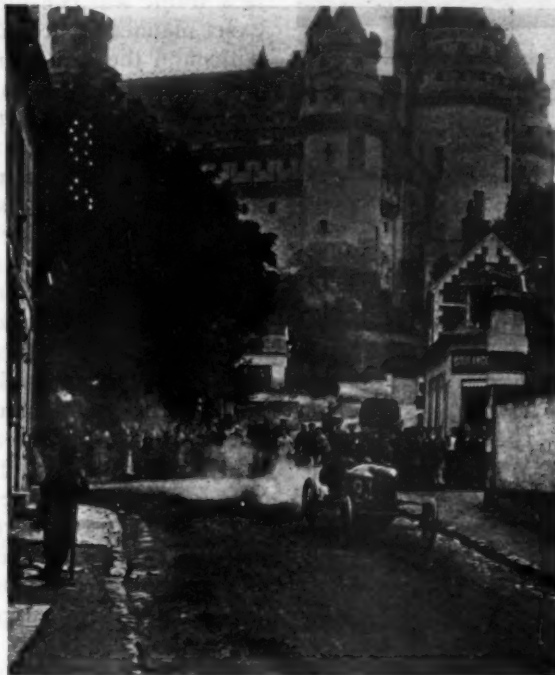
When the meeting opened with delegates present from France, Germany, America, England, Belgium, Italy, Switzerland, Spain, Austria, Hungary, Portugal and Egypt, it was rapidly agreed to that the method of regulation should be by limitation of bore. England alone held aloof declaring that power, and not bore should be limited. French delegates had instructions to insist on a maximum bore of 140 millimeters; Italy, Germany and Belgium were known to be strongly inclined towards a maximum bore of 130 millimeters, on the ground that engines of this size would furnish an average speed of 70 miles an hour, which was quite sufficient for the public. The French objection to a very small bore appeared to be that the greater the limitation the greater the departure from commercial models, or from models giving experience for everyday use.

There was a long fight before a common meeting ground could be arrived at, France finally abandoning its bore of 140 in favor of 130, but maintaining its minimum weight of 900 kilos. Germany held for 130 bore and 1,000 kilos weight, and Italy tried to reconcile all parties by 135 millimeters and 900 kilos. On a vote being taken the French proposition was adopted, Germany and Italy abstaining. America did not figure in the discussions, and the ideas of France seemed most satisfactory to its delegates.

Under the new regulation, which will be the international law for 1909, no race—other than a local event—can be held with racers having other than 130 millimeters bore and a maximum weight of 900 kilos empty. The cars will be lower powered than those of the present season, when the 155 millimeters rule was in force, but it is doubtful if they will be much slower. At Bologna, last month, where a 130 millimeter race was held, the winner averaged 65 miles an hour with a bore of 120 and a weight of 1,200 kilos, while several faster, but less regular cars, attained over 90 miles an hour on a straightaway. Speed, therefore, will be high, despite the drop from 155 to 130.

Tire Trouble Should Be Less.

By reason of the lower minimum weight it may be expected that tire trouble will be considerably less than at any of the preceding international races, where the cars have always been at the limit of their pneumatics. The question of rims and tires came up for discussion at the conference, the Marquis de Dion for France and Mervyn O'Gorman for England asking that dismountable rims should be forbidden, in order to force tire manufacturers to improve their product. The bandishment of rims



Picturesque Setting of a French Race.

would, of course, entail the abandonment of dismountable wheels that England has been asking for during the past two years. René de Knyff was inclined to favor the ban on quick changing devices, but would not pronounce definitely until he had consulted his colleagues of the Commission Sportive. Finally it was decided to hold over the question until the next meeting, to be held November 30, during the Paris Solon.

After hanging fire for two years the Gobron question was forced on the meeting and a decision arrived at in favor of multiple piston engines. Under the old Gordon Bennett rules the Gobron motor was, of course, admitted. When, for 1906, it was decided to limit bore the regulation was so worded that it was practically impossible for the Gobron engine, with two pistons per cylinder, to compete. Last year the same attitude was persisted in; this year, however, a strong stand was made, and the

conference finally decided to allow the Gobron, with its two pistons per cylinder, to compete on the same footing as engines of the usual type. This decision finds general approval.

Small Cars Interested France Alone.

The voiturette regulations were quickly settled, this matter being of important interest to France alone. For single cylinder engines a maximum bore of 100 millimeters was maintained; two cylinders were given 80 millimeters, and four cylinders allowed 65 millimeters. Instead of 600 kilos minimum weight an increase was made to 800 kilos (1,763 pounds).

It had been decided by the International Road Congress to limit road signals to four only. The German club, therefore, brought forward a similar proposition and submitted the signals that it considered most suitable, these to be adopted as far as possible by all nations. In view of negotiations now carried on by the Touring Club of France and the Association Générale Automobile, the question was postponed until the November meeting. An attempt to arrive at a formula for touring cars was also postponed, and the British proposition to revive the Gordon Bennett conditions met with a firm refusal. Norway made application to be admitted into the international conference and was welcomed.

Chateau Country Is Favored.

An official decision regarding the Anjou course for next year's French Grand Prix may be expected this week. Indications are that the set of roads in the Château country will be adopted, but it is not yet known exactly how the course will be laid out. As the result of the reduction of bore a larger entry than usual is possible for the Grand Prix, and if, as is already proposed, the Automobile Club of France decides to reduce entry fees to \$800 per car, \$1,800 for a team of three, and to offer handsome cash prizes from 80 to 100 starters can be counted on. Such a number of cars would necessitate either a larger course or an elimination race. It will therefore be necessary to arrive at a definite conclusion regarding the race before selecting the roads. Chateauland would be a most inviting place to attract visitors from other countries.

THE AUTOMOBILE

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THAT INTERNATIONAL ROADS CONGRESS.

Apparently there was one most unfortunate defect in the recent International Roads Congress instituted by the French Government and participated in by delegates from 29 countries, including the United States, France, Great Britain, and Germany, the four countries wherein the automobile has its greatest usage.

Talk there was aplenty, and much of it contained the oft-repeated charge that the automobile is "destroying the roads." There was no automobilist present to make suitable reply, and as far as the congress is concerned, the motor-driven vehicle stands more or less convicted as being guilty of destroying the highways. If travel over a given length of road is increased many fold by any type of vehicle, it is a simple case of addition that it will wear out that many times the sooner. It is a question of multiplied traffic that the roadmakers are called upon to answer, and it is their plain problem to bring the highways up to date and meet conditions that have arisen.

In this direction the Paris congress made slight, if any, progress, and the deductions of those present were confined to meager generalizations of practical value, at least for the moment, and until they develop into something more definite. The ideal road was the subject on which there seemed to be some differences of opinion, the adap-

tation of highways to modern conditions of locomotion remaining an unsolved problem as far as the first International Roads Congress is concerned. The effect of this new traffic was considerably enlarged upon, but as to the exact manner of providing something which would better withstand the greater use of the highways, the offerings were rather sparse and unsatisfactory, though it was generally recognized that something is absolutely demanded in the future, at least upon main traveled roads.

Before the next congress takes place it is reasonable to suppose that the roadmakers will have gained experience sufficient to enable them to recommend an up-to-date form of highway construction which will adequately meet the demands of motor-driven traffic, the growth of which is certain to be enormous within the next twelvemonth, for ultimately it will supplant all other forms of individual and commercial transport. That this will come at an earlier date than many believe is presaged by the gradually growing interest of the farmer and the sale of many cars to country dwellers.

In a touring article contained in this issue will be found some most interesting information concerning the increase of roads building in our Southern States, and explaining why it is bound to become even more general. Not as plentifully supplied with railroads as the Northern States, the South is finding the automobile a most available vehicle for abridging distances. But roads are a necessity, not a luxury.



PRICE OUTLOOK FOR SEASON OF 1909.

Predictions as to price reductions in the automobile field have been rife for a number of years past—in fact ever since the automobile became a practical machine, and every year since then the realization has been eagerly looked forward to by that portion of the public which has ambitions to enter the ranks, but is prevented from financial considerations. In the abstract, this demand has been for "a good four-cylinder machine at a medium price," and since it was first voiced—a time when there were few if any cars having a four-cylinder motor that listed under \$3,000—the figure has gradually been receding. That is, up to last Summer, when the moment for the announcement of a shrinkage that can hardly be termed gradual, appears to have arrived.

Of course, the plans for the production of a machine embodying the usual standard features at a price far below what anything of the kind had ever been offered for hitherto, were in preparation for some time, and their culmination naturally precipitated the announcements of others who were preparing to enter the same field. Just what effect these cuts would have on the policy of makers specializing on low-priced cars was somewhat problematical at the time, but developments during the quarter intervening would seem to indicate that efforts to compete have been more along the line of an improved machine at the same, or a slightly lesser figure than formerly, rather than a wholesale cut merely to meet competition. This is a gratifying tendency that speaks volumes for the healthy condition of the industry, as any other course could only be detrimental, both to the participants and business generally. Prices for 1909 will not only be lower than ever before, but the automobile will likewise represent more for its cost than was ever before possible.

MOTOR PARKWAY RACING CLUB FORMING.

Preparations are under way for the formation of a racing club to conduct contests on the Long Island Motor Parkway. The A. A. A.-C. A. peace agreement, it will be remembered, provided that future Vanderbilt Cup and Grand Prize races should be run by such an organization.

Arrangements are being made by the Long Island Motor Parkway officials for a series of sprint races over the cement stretch, to be held Saturday, December 5.

Cars which competed in the Long Island Motor Parkway Sweepstakes (for cars selling above \$4,001) on October 10, those in the Vanderbilt Cup race, and cars which are to compete in the Grand Prize race in Savannah on November 26, are eligible.

LOCOMOBILE WINS LOS ANGELES 24-HOUR.

LOS ANGELES, CAL., Nov. 2.—The first 24-hour race ever run on the Pacific Coast proved a huge success, no one being injured and the contest being remarkable for the showing made by the tires. Seven cars contested, and their total mileage was 3662 miles at racing speed, yet only five tire changes were reported. The race was won by a Locomobile, driven by Murray Page, which covered 921 miles, Page sticking to the wheel 21 hours. R. J. Leavitt, the 280-pound representative of the Locomobile here, drove the remaining 3 hours. Second to the Locomobile was the Franklin six, with 836 miles. The Studebaker had 628, and the Reo 474. The Chalmers-Detroit Bluebird, Pope-Hartford, and Sunset retired before the finish, the Sunset going through the fence Sunday night.

A PAIR OF MAXWELL GLOBE GIRDERS.

Mr. and Mrs. H. A. Hover, of Hover, Washington, reached New York last week, having completed in their 20-horsepower Maxwell touring car a run across the continent, the first stage of what is planned to be the longest automobile journey ever undertaken by amateurs.

Since April 11 they have journeyed from Tiajuara, a small village on the Pacific coast, in their 20-horsepower Maxwell touring car. From that point they have crossed California, Washington, Oregon, Idaho, Wyoming, Colorado, Nebraska, Iowa, Illinois, Indiana, Ohio, and New York, and have visited Niagara Falls, Canada, thus accomplishing what is believed to be the first feat of crossing the United States from south to north and from east to west in a vehicle of any kind driven over the public roads.

The travelers will shortly sail for Algiers with their car and spend the approaching Winter in touring Algeria, Tunis, and Egypt, penetrating the Sahara Desert at least to Biskra. Crossing to Italy in the Spring, the next three years will be devoted to crossing every country in Europe, at least one way, with some touring in Western Siberia.

In the Winter of 1911 the homeward trip will be begun by crossing from Turkey into Palestine, where the car will be driven to Jerusalem and back to the coast, then taken to India, China and Japan, the Philippines, Australia, New Zealand and Hawaii, autoing in each as much as is feasible. From Hawaii they will sail for San Francisco in the Winter of 1912, and they expect to have covered on their way more than 75,000 miles, parts of the journey in districts where an automobile has never been seen.

FISK TIRES IN THE VANDERBILT.

Editor THE AUTOMOBILE.

In your issue of October 29, under the title, "Story of the Tires," we desire to correct the statement with reference to the Fisk tires on the Knox cars. The 50-horsepower car, driven by Denison, changed only one tire on the left front, this change being necessary on account of puncture, while the 40-horsepower car, driven by Bourque, changed two rear tires from non-skids to flat-treads, as your article states, but these were the only changes made, and he had no trouble with the front tires and finished on the same ones that he started on.

THE FISK RUBBER COMPANY,

Chicopee Falls, Mass.

C. H. Gage.

ABOUT A DASH FROM MICHIGAN TO MAINE.

BANGOR, ME., Nov. 3.—With the arrival here of the appropriately dubbed "Jackson Mud Hen," which left Jackson, Mich., October 27, in charge of E. P. Blake and Charles G. Percival, there was brought to a close one of the most strenuous runs that the new light cars have recently been put to. The car is the new Jackson four-cylinder model listing at \$1,600, or as the makers term it, their "dollar-a-pound-car." Mr. Blake is the owner of the car, as well as the eastern representative of the Jackson company, and in addition to affording a test of the car's endurance and speed, the autoists carried a message from Mayor Glasgow, of Jackson, Mich., to Mayor Woodman, of Bangor. The start from Jackson was made at most unpropitious time, making the trip right from Detroit, through Buffalo and Rochester, a plough through the mud, the amount plastered over the car upon its arrival at the last-named place earning it the above sobriquet. Up to that time, the only difficulties encountered had been lack of fuel, which always happened at inopportune times, a rural apothecary in Elyria being aroused at an early hour for a supply of alcohol, which was the only thing to be had.

While entering the garage at Rochester for a fresh supply of gasoline, a trolley car hit the machine, breaking its rear axle and fracturing two of J. S. McArthur's ribs. McArthur had been



E. P. Blake and Chas. G. Percival, Who Made the Run.

acting as mechanic on the trip, and was sent back from that point, Messrs. Blake and Percival alternating at the wheel from that point on. The remainder of the route lay via Albany and the Berkshires to Boston, where the tourists arrived Saturday last. One of the most remarkable things about the trip was the utter lack of tire trouble, in spite of the strenuous driving and bad roads, the Goodyear tire and rim equipment not even having been pumped on the journey to Rochester.

CONCERNING THE GENERAL MOTOR COMPANY

DETROIT, Nov. 3.—Persistent rumors are being circulated in automobile circles to the effect that the long-talked of automobile combine, which J. P. Morgan is credited with promoting, and which would be equal in its field to the United States Steel Corporation, is about to become a reality, with several Michigan concerns figuring prominently in the deal.

Among the companies mentioned in this connection are the Buick Motor Company, of Flint, and the Oldsmobile Company, located at Lansing. It is known that representatives of J. Pierpont Morgan have been in Lansing for some time quietly investigating the affairs of the Oldsmobile Company. That their report was favorable is the assertion of those who profess to know. The Buick company is also said to have come in for consideration.

As outlined by those in touch with the situation, the plan is to take over a number of the leading plants throughout the country, devote each to the production of a single model, and exert an influence not unlike that now wielded by the United States Steel Corporation.

FALL ACTIVITIES OF THE AUTOMOBILE CLUBS

NEW ORLEANS NOW HAS AN A. A. A. CLUB.

NEW ORLEANS, LA., Oct. 26.—The Crescent City has at last awakened to the fact that she has all of the advantages, both natural and otherwise, of becoming the automobile center of the South and the automobile racing center of the whole country during the winter months. The success that Savannah has had in her automobile ventures has stirred New Orleans enthusiasts into action, and as a result the New Orleans Automobile Club has been formed. A charter membership of fifty was secured, and the following are the officers: President, Thomas C. Campbell; vice-president, Theodore Grunewald; secretary-treasurer, Homer George; board of directors, Frederick I. Thompson, chairman, Ginder Abbott, W. P. Johnson, A. M. Cook, and H. A. Testard.

The meeting was most enthusiastic, and it was decided to affiliate immediately with the American Automobile Association. The two days' racing in November of course will be sanctioned by the A. A. A.

The aim of the club is chiefly for good roads. The club will soon take up the question of signboards and warnings for motorists and also the building of a new road for automobiling and a clubhouse. A vigorous campaign for members will begin at once, the club having as its aim a membership of one thousand. All persons interested in good roads, whether automobile owners or not, will be urged to join. The formation of the New Orleans Automobile Club is regarded as perhaps the biggest happening in Southern automobiledom in several years. There is no doubt of the club's success. Enthusiasm in the matter has been so well worked up that the whole town is talking about it and practically all of the prominent business men are pledging support. Besides the campaign for good roads, the club will pull off first class races during the Winter months, for which a number of big racing cars have arrived.

The New Orleans club intends to follow up its track meeting with a 250-mile road race, the first of its kind ever pulled off in this section of the country.

President Thomas C. Campbell and three members of the racing committee recently made a tour of the good roads around the city, Mr. Campbell riding on the racing car of Arthur Redfern, which will be one of the entries in the races. Redfern drove his car on stretches at a sixty mile an hour gait and shot around turns without slackening speed to any extent. The club officials were highly elated over the demonstration.

VERMONT CLUB ELECTS NEW OFFICERS.

MONTPELIER, VT., Nov. 2.—At the annual meeting of the Automobile Club of Vermont held recently at the Pavilion hotel, Montpelier, the following officers were elected for the coming year: President, W. W. Brown, Springfield; first vice-president, A. C. Whiting, Burlington; second vice-president, James M. Boutwell, Montpelier; secretary and treasurer, Lester H. Greene, Montpelier; director, C. H. Slocum, Morrisville. The attendance was the largest in the history of the organization and every indication points to a most prosperous year.

WILLIMANTIC CLUB DOING GOOD WORK.

WILLIMANTIC, CONN., Nov. 2.—As winter draws near, when most of the cars will have to be housed for a while, the fifty members of the Willimantic Automobile Club feel that they have completed a very successful season. The club has accomplished much in the way of improvement in the road conditions of this vicinity, and the new road signs will be erected before the cold weather sets in. Plans are under way for procuring club rooms, which will help materially to keep the members together preparatory to an active good roads campaign in the spring.

BLISS PRESIDENT OF MASSACHUSETTS BODY.

BOSTON, Nov. 2.—A. E. Bliss, of the Malden Automobile Club, has been elected president of the Massachusetts State Automobile Association, succeeding Elliott C. Lee, of the Bay State Association. The annual meeting of the association was held at the rooms of the Bay State Association and there was a good representation of the constituent clubs. Besides the change in the presidency there is a change in the second office, A. D. Converse of the Winchendon club becoming vice-president in place of John P. Coughlin of Worcester. J. C. Kerrison of the Bay State Association was re-elected treasurer, and the selection of the secretary was left with the president and vice-president. Secretary James Fortescue of the Bay State Association, who has served the State association as secretary for two years, positively refused to continue in the office. A. D. Converse, the new vice-president, was appointed chairman of the Legislative committee, succeeding L. R. Speare, who declined to serve longer in that position. W. H. Chase of the Wachusett club of Fitchburg was reappointed chairman of the good roads committee, and John P. Coughlin was reappointed head of the sign board committee.

MARYLANDERS OBJECT TO SPECIAL TAX.

BALTIMORE, NOV. 2.—The Automobile Club of Maryland is determined to fight to a finish the proposed special tax recommended by Governor Crothers and the State automobile commission. At the club's last meeting the following resolution was unanimously adopted:

Resolved, That the members of the Automobile Club of Maryland are willing to pay their full proportion of taxes on their automobiles in the manner proscribed by the Constitution of Maryland, but stand unequivocally opposed to any special tax upon automobilists as a class to the exclusion of the owners of other vehicles, such proposed special tax being un-American in principle and in direct conflict with our State Constitution.

The question of levying the special tax for the purpose, as the Governor explained, of improving and maintaining good roads, has stirred up the members of the club to such an extent that a canvass of every automobile owner of the State is proposed to enlist his sympathy and support in fighting legislation affecting the interests of Maryland autoists. President Rowe advocated that before the end of the year every owner of an auto in Maryland should be seen personally and have him get his friends to work with the automobilists in getting proper laws to protect the automobile industry in this State, upon the ground that unjust taxes would surely drive the automobile and its benefits from the State.

MILWAUKEE WANTS TO BE IN NEXT TOUR.

MILWAUKEE, Nov. 4.—Milwaukee wants to be included in the route of the 1909 Glidden tour, and it wants this favor badly. So every member of the Milwaukee Automobile club, agents, manufacturers and owners, will petition the manufacturers through the A. A. A. to make Milwaukee a stopping point. Secretary James T. Drought, of the M. A. C., returned from New York with the news that the A. A. A. was favorably disposed toward the plan, but the manufacturers were not, and now every effort will be made to influence the latter.

At the annual meeting of the Milwaukee Automobile Club, Dr. Louis Fuldner, president; James T. Drought, secretary, and Lee A. Dearholt were re-elected directors. On Nov. 10 the club will meet again to consider the recommendation of increasing the board of directors from nine to fifteen. At this time the old officers will no doubt be re-elected, having given such splendid service for the last few years. The annual report showed the club to be in the most prosperous year of its six-year history. The treasury contains \$1,500, not including \$1,200 annual dues to be collected early in January.

THE 1909 RAMBLER SPARE WHEEL.

A unique feature of the 1909 Rambler line just announced by Thomas B. Jeffery & Company, which will attract a great deal of attention, is the Rambler spare wheel and inflated tire. All 1909 four-cylinder Ramblers are fitted for this equipment, which consists of a wheel complete, except the hub center, on which is carried a complete tire, inflated.

The wheel is secured to the hub center by six bolts. Removing the six nuts from these bolts, the wheel can be detached by means of special tools, a wheel puller and a socket wrench. Only three minutes are required to make the change.

This spare wheel is a regular wheel in every particular. It fits on either front or rear, and it is not necessary at the end of the trip to change it. In the event of tire trouble, the injured tire can be repaired, replaced on the original wheel, inflated, and that wheel is thereafter carried as a spare wheel. Besides being a handy provision against tire trouble, an extra wheel is always valuable in case of need.

Special brackets are provided to carry the wheel and tire, and an extra charge is made for the complete equipment. The illustrations tell the story quite conclusively.

DIAMOND TO HAVE RACING DEPARTMENT.

What may be regarded as the first practical step taken with a view to placing automobile racing in this country on the well-regulated basis, where tires and similar equipment are concerned, that has always distinguished the big establishments on the Continent, and which has doubtless been accountable in large measure for the success of foreign makers, has just been inaugurated by the Diamond Rubber Company, of Akron, O., in the shape of a racing department, which will be in charge of Joe Tracy, the well-known American driver. Speaking of this move on the company's part, one of the Diamond officials said:

"Mr. Tracy has been retained by us not only as consulting engineer on all racing equipment matters, but to have charge of a racing department we have organized which will be most complete in every respect. We are making no great predictions, but neither are we simply making a bid for increased publicity for our product. What we are doing is building up our organization so that we can take care of racing matters on a large scale. It is our present conviction that the automobile public demands the Vanderbilt and all similar big racing events."

Mr. Tracy will continue to retain his New York location, and states that he will be able to attend to other consulting commissions as in the past.

FIRE WILL NOT STOP DAYTON COMPANY.

DAYTON, O., Nov. 2.—In spite of the destructive fire which completely gutted the upper floors and badly drenched with water the lower portion of the building occupied by the Dayton Electrical Manufacturing Company on the night of October 21, the company found that enough of the undamaged stock was available for shipping to continue the business, except for the manufacturing end, just as though nothing had happened. This finished stock is sufficient to run for about six months, and in the meantime work on the new factory is being rushed to completion, so that by early Spring it will be possible to manufacture the 1910 stock.

"BEN" GOES HOME TO SELL CARS.

SYRACUSE, Nov. 2.—C. Arthur Benjamin is coming "home." He is going to sell Packard and E-M-F "30" cars, having just made Syracuse agency arrangements for these two makes. "Ben." is known from coast to coast, and he has sold automobiles of one kind or another since the beginning of the industry in this country. His latest connection was with the Aerocar Company, of Detroit. Benjamin has contracted for 150 E-M-F "30" cars, and already has disposed of one-third of them to sub-agents and has booked several retail orders in Syracuse and vicinity.



Fig. 1—3 P.M.—The start—jacking up the car.

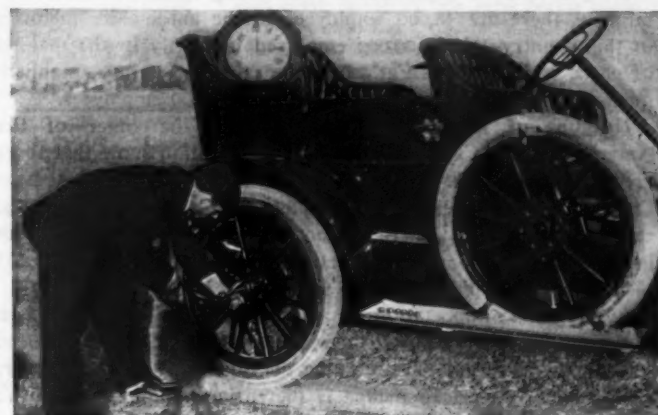


Fig. 2—3:01 P.M.—Wheel entirely loosened, ready to be taken off.

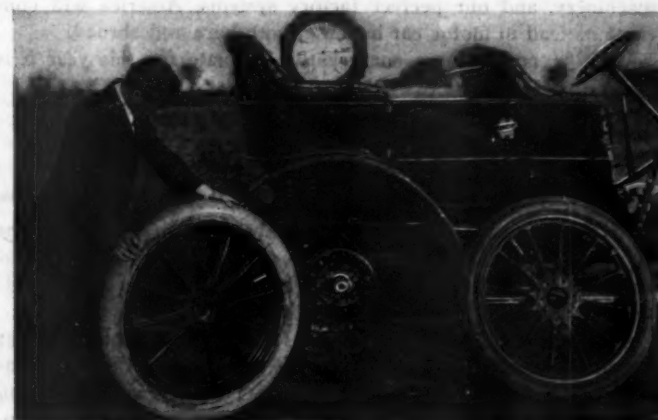


Fig. 3—3:02 P.M.—Spare wheel ready to go on.



Fig. 4—3:03 P.M.—Spare wheel with inflated tire in place.

CONCERNING THE FUTURE OF THE AUTOMOBILE

By ALFRED REEVES, GENERAL MANAGER OF THE A. M. C. M. A.

"The Automobile's Future in America" is a big subject. The statistics of the past ten years are our main guidance for the future of this great industry. Many of the early figures are lacking, but it is safe for us to say that the automobile sales in 1903 were considerably less than \$8,000,000, which has increased to over \$105,000,000 in 1907, while this year's figures, when compiled, will show almost, if not about the same, despite the recent financial depression. During 1907 something like 52,000 cars were made and sold, and this year will supply about the same figures, although most of them are of the small type. It is estimated that the present capital of the automobile business is about \$105,000,000, with an additional \$36,000,000 in kindred trades, and \$57,000,000 more in garages and retail salesrooms, making a total of \$198,000,000. According to latest figures obtainable, there are 58,000 employees in the automobile factories in this country—about 29,000 employed indirectly in the making of parts, while there are 21,500 in the sales and garage establishments. This gives a total of more than 108,000 employees.

Number of Makers.—The records at the office of the American Motor Car Manufacturers' Association show that there are in this country 253 builders of automobiles, of which at least 123 are beyond the experimental stage, and are placing practical cars on the market. There are not less than 500 different trades involved in automobile manufacture, running from leather, varnish, broadcloth and buttons to steel, brass and rubber.

Although the importation of automobiles is fast decreasing, it is a fact that some \$28,000,000 worth of foreign cars have been sold here. The trend is now going the other way, and the export trade of the American maker is increasing rapidly. It doesn't take very much of an imagination to figure that with our business methods, our unexcelled mechanics, our wonderful automatic machinery, and our perfect factory systems, America will continue its lead in motor car building, both here and abroad.

With 52,000 cars as a conservative estimate for this year it is

safe to say that 175,000 automobiles have been sold here during the past eight years. They are big figures, but it is a big industry.

During the past year 13,980 cars have been registered in New York City alone, making a total registration since the law went into effect, of 63,338 cars. Above all, and of great interest to those about to enter the trade, is the fact that 9,386 new chauffeurs were registered during the current year. One cannot be a pessimist on the automobile's future in the face of such figures. What of the future of this greatest improved individual transportation of man? The past makes good reading and good history, but as matter-of-fact people we are interested in what confronts us.

Production for 1909.—Factory reports indicate a tremendous production in motor cars for next year, running from machines that range from \$150 for the schoolboy to \$11,000 cars for the luxury-loving and speed-fascinated millionaires. Four factories alone announce a total production of 36,000 cars, two of the leaders planning to turn out 12,000 cars each. Yet there is no reason to believe that next year will see an overproduction, provided good cars are made and sold at reasonable prices. The tremendous buying power of this country is evidenced in a score of ways, and particularly by the absorbing of motor cars during the past two years. Possibly next year's production will reach 75,000 cars. Yet we well know for the past five or six years a million buggies a year have been made and sold by the carriage people. Just what becomes of them no one has been able to say, but the buggy manufacturers continue to turn out these great quantities of horse-drawn vehicles. They are now turning their attention to motor vehicles, for the farmer is demanding the more modern type, for which he is quite ready to pay the price. One of the largest concerns of agricultural machinery plans to make 20,000 cars next year, yet this will hardly give them one apiece for their agents throughout the world.

THE AUTOMOBILE AS A WORLD-WIDE FACTOR

By E. P. CHALFANT, ASSISTANT GENERAL MANAGER OF A. L. A. M.

THE automobile, after all, is simply a manifestation of the forces of evolution that are working out the world's destiny, and its appearance is no more remarkable than was the advent of discoveries in other lines of endeavor.

A Vehicle of Commerce.—There can be no doubt now that the automobile is to play a permanent part in the affairs of mankind. If it had nothing else to recommend it but its time-saving and health-giving attributes, it would be a permanent institution. But it is as a vehicle of commerce that it is to figure more prominently in the future. Its commercial phases are practically unlimited. What the world wants are labor-saving devices, and the automobile is one. Manufacturing plants are hauling their product with motor cars in lieu of horses. They find the innovation an economical one from every standpoint.

Municipal Use.—Then, again, the automobile is to become a part of every well-regulated municipality. In many of the large cities of the country to-day motor cars are utilized with great success in the health and fire branches of the public service. They are found to be invaluable to hospitals, where a minute's delay sometimes means loss of life. The same can be said of the fire department, in which branch of the municipal government they have served to advantage. The Federal government, too, has become converted to their utility, and has installed motor cars in the post office service of the principal cities.

Miner and Farmer.—But it is not alone in the large cities that the labor and time-saving properties of the automobile are

appreciated. In the isolated sections, far from the beaten paths, the miner and farmer have endorsed the horseless vehicle by using it. This apparent popularity of the automobile, however, is not confined to one section or nation. It is world-wide in its scope. It is as pronounced in the Orient as it is in America.

World-wide Good Roads Movement.—Automobilists in Japan are recognizing this fact, and good roads all over the Empire no doubt will soon be seen. The government should send several emissaries to Massachusetts, which State, I believe, has the finest roads in the world. That is another phase of the motor car that must not be overlooked. The good road movement is now world-wide. Its agitation was begun by the advent of the automobile, and the great benefits that are derived to-day by the construction of good roads must be credited to the motor car. In this country Ohio and Iowa possess the poorest roads. In certain seasons of the year the highways of the latter State are well-nigh impassable, the black loam apparently having no bottom.

But there is nothing unusual about this, as America, on the whole, is famous for hard road conditions. That is why the American manufacturer gives his product liberal clearance, and why the domestic car, typified in the product of the Licensed Association, is able to endure difficult going.

Manufactures.—The United States annually produces something like 80,000 automobiles, while Italy manufactures 25,000 and France 40,000. Germany is another producing nation, as is England, but the two first mentioned build the bulk.



Candidate for Indiana Governorship Made a Whirlwind Tour in Premier Pathfinder.

Auto Travel and the Steamers.—Not many years ago it was the custom of Americans going abroad to rent foreign cars on the other side, but within the past two or three years this has been changed to such an extent that shipments of American cars for private use in the Spring and their return in the Fall, have become an item of considerable importance with many of the Transatlantic lines. Formerly, tourists were content to land at Cherbourg, Havre, Southampton or Bremen, but now many prefer a Mediterranean port, and the business has increased to a point where one of the lines has decided to make changes in the construction of its vessels in order to accommodate the largest enclosed cars between decks. This space has previously not been sufficient to permit of stowing the crates used for closed cars and it will accordingly be increased nine inches on all the steamers of this line. This information comes from the George N. Pierce Company, of Buffalo, N. Y., and reached it in the shape of a letter from the steamship company in question, owing to the fact that one-fourth to one-third of the machines shipped for touring purposes were Pierce-Arrows.

G & J Tire Company Addition.—The G & J Tire Company, Indianapolis, Ind., have broken ground for the erection of a large addition, the new building when completed giving the company about 50,000 square feet of additional floor space. When asked as to the possible effect of the reduction in prices on the 1909 product, President B. C. Dowse made this statement: The main element that justified our reducing the price of G & J tires for 1909 is the reduction in our cost of production. This has been brought about by our improvement in the methods of manufacture, which has resulted in fewer replacements on our guarantee, and increased factory capacity, which has greatly reduced our overhead expense. We shall continue the coming season to use the same quality and quantity of materials as we have in the past, and shall put forth every effort to make the best tire on the market. Ours is the only rubber company in this country devoted exclusively to the manufacture of pneumatic tires, and for that reason all our efforts are concentrated upon this one line."

Greatest Wonder of the Age.—A circular put out by the Heney Gas Engine

Company, Ligonier, Ind., which proposes to exploit the automobile field, puts forth these claims: "The Greatest Wonder of the Age: Self-igniting; no batteries; no dynamo; no hot-tube; no spark plugs; no valves; no cams; no cogwheels; no weak sparks; no wires; no trouble starts in the rain, starts in the snow; nothing to adjust; no cams to set; no sparkers to set." And then the manufacturer logically ends by saying: "What more can you ask?" Nothing! On second thought, one might inquire, will there be any "back-kick"? One is inspired to ask the question by a casual statement in the circular informing of the ability of the engine to "mote" both ways. If the motor is strong-minded, and will positively go one way at a time, all right; otherwise, one's poor judgment is: "there is one point in the dark."

Trouble Among Auto-Buggy Makers.—The Success Auto-Buggy Manufacturing Company, of St. Louis, has brought suit in the United States Court at Indianapolis against two of the motor buggy builders of that State for what is claimed to be infringements of patents held by the Success company. The statement is made that these companies, namely the W. H. Kiblinger Company, of Auburn, Ind., and the Economy Motor-Buggy Company, of Fort Wayne, Ind., entered into an agreement with the plaintiff whereby they were to pay the Success company a royalty on each buggy manufactured by them, but that the defendants have failed to carry out this agreement. The proceedings are the result of defendants' refusal.

Prize Float at Syracuse Fair.—In the commercial float parade of the Ka-Noo-No Carnival, which is held annually in connection with the State Fair at Syracuse, the float entered by the New Process Raw Hide Company, of Syracuse, N. Y., won first prize in the machinery division. The central object of the float was a huge globe about five feet in diameter, made of raw hide and surrounded by a large gear ring at the center. Inside the globe were thirty incandescent lamps, and as the raw hide is translucent the effect at night was rather striking, made doubly so by the fact that the globe was revolved by gear and chain connection from the rear wheels of the wagon.

Chicago-Milwaukee "Great White Way."—The Chicago-Milwaukee Road and Real Estate Company, which plans to construct a \$2,000,000 "Great White Way" from Milwaukee to Chicago, will give a dinner to Milwaukee business men this week to rouse their enthusiasm for the plan. H. D. Layman and J. F. Moeller, of Chicago, have been in Milwaukee for some days talking up the project. It is planned to place \$54,000 of the \$100,000 common stock in that city. There will be an additional issue of \$2,000,000 preferred stock. The scheme is to build a boulevard 144 feet wide, which will be the finest motor and horse parkway in the world.

Hoosier's Successful Trip East.—R. I. Love and party have just returned to their homes in Indianapolis, after completing a most successful trip of over 5,000 miles in a Premier Six. The route of the tour was East, most of the time being spent in and around the Adirondacks, where the road conditions were not of the best, but Mr. Love says that at no time were they inconvenienced by repairs, even escaping with the small number of four punctures. On the return trip the party covered 1,300 miles from Saranac Lake to Indianapolis in a week, having encountered good roads, with the exception of the strip between Toledo and Fort Wayne, where rains had made the going very heavy.

J. H. Neustadt Retires.—The announcement is made that J. H. Neustadt, founder of the Neustadt Automobile & Supply Company, of St. Louis, has disposed of his entire interest in the business and retired. In the reorganization which followed, the following officers were selected: President and treasurer, E. L. Epperson; vice-president, F. J. Tecklenburg, and secretary and general manager, H. W. Gray. Mr. Epperson has been associated in many ways with the automobile industry and other enterprises, while Mr. Gray is retained from the old organization. The Neustadt Company was one of the pioneers in the supply business and has become one of the largest in the country.

Southern Tier Motor Company Expanding.—The recently incorporated Southern Tier Motor Company, of Elmira, N. Y., has taken over the automobile business formerly conducted by the Elmira Arms Company's motor department and the Willys-Crew Motor Company. The new organization will occupy the garage which the latter company controlled. The company will have the agency for several lines of cars, although the Overland will be featured. Guy W. Shoemaker, the president of the firm, will give his entire attention to the trade in Elmira and vicinity, while the secretary, Harry K. Crandall, will look after the outside and road work.

Large Quantities of Oil for the Vanderbilt.—As an example of the immense amount of oil used in connection with a race like the Vanderbilt, A. W. Harris, of Providence, states that the nine cars which used Harris oil in that event took delivery of over 900 gallons, each car averaging 100 gallons apiece. This may sound like a large figure for an event of such comparatively short duration, but it should be remembered that not only must a sufficient amount be provided for all emergencies, but that part of the oil is used by the camp tenders and during practice.

A. M. C. M. A. Hand Book Ready Soon.—The official hand book of the American Motor Car Manufacturers' Association, "Leading American Cars," which is published annually by this association, will be ready for distribution

at an early date, as the data is now in the hands of the printers. The mechanical details will be arranged according to price classification, with separate divisions for pleasure and commercial vehicles. Besides the mechanical details, interesting data will be given about 1909 models made by the members of the A. M. C. M. A.

Motorcar Company Elects Officers.—The Motorcar Company of Detroit, manufacturers of the Cartercar, has elected the following officers of the company for the coming year: President, F. T. Caughey, Detroit; vice-president, A. G. North, Pontiac; secretary, H. R. Redford, Detroit; treasurer, H. G. Hamilton, Pontiac; general manager, R. A. Palmer, Detroit. This company has purchased the plant of the Pontiac Spring & Wagon Works at Pontiac, Mich., and will remove from Detroit.

First Entries for 1909 A. A. A. Tour.—Although the 1909 A. A. A. Tour for the Glidden Trophy is still nine months away, automobile manufacturers have commenced preparations for it. The first public evidence of this activity is the entry of three Molines in the runabout class, and W. H. Van Dervoort, of the Moline Automobile Company, East Moline, Ill., has requested of Chairman Hower that these three cars be given the first numbers in this class.

Anderson Increases Capital Stock.—The Anderson Carriage Company, Detroit, Mich., builders of the Detroit electric, recently passed resolutions increasing the capital stock of the company from \$300,000 to \$500,000. An output of 1,000 electric cars is the announced total for 1909. The concern also manufactures horse-drawn vehicles, of which it will make 15,000 for 1909.

Change in Lancia Price.—The Hol-Tan Company announces that on December 31, the day of the opening of the Palace show in New York, the price of the Lancia chassis will be advanced from the present price of \$2,800 to \$3,000. The change has been found necessary because of the increased demand for these cars following

the good showing made in the different events in which they have participated.

Woodworth Treads Reduced in Price.—The Leather Tire Goods Company, Newton Upper Falls, Mass., announce a new price list for the Woodworth treads. The prices are substantially reduced, though the firm states that there has been no change whatever in the high quality of the product. A letter to the factory will quickly bring a copy of the reduced price list.

"Spit-Fire" Plugs Share in Victory.—Two cars which have attracted attention lately by their fast work were equipped with Mosler "Spit-Fire" spark plugs, namely the winning Simplex in the last 24-hour race at Brighton Beach and the 12-cylinder Maxwell which did a mile in 31 seconds at Atlantic City.

New Facilities for the Oakland Company.—The work on the large additions to the Oakland plant at Pontiac, Mich., was commenced last week and the buildings will be rushed to completion as fast as possible in order to be available for the company's increasing business.

IN AND ABOUT THE AGENCIES.

Maxwell, Philadelphia.—The Maxwell-Briscoe Motor Company has leased the former Philadelphia branch house of the Rambler at 207-209 North Broad street, for the future home of the Maxwell. Incidentally the concern which will handle the car has undergone a change of name from the Kelsey Motor Car Company to the Longstreth Motor Car Company, with William C. Longstreth as general manager. There will be no change whatever, in the personnel of the company.

Rambler, Philadelphia.—A surprise in the nature of a shock struck Philadelphia's "Gasoline Row" last Thursday when it was announced that Thomas B. Jeffery & Company had decided to abandon Philadelphia as a contributing center and concentrate its Eastern business in New York City. The Tioga Automobile Company, at Broad and Tioga

streets, George C. Brownlee, manager, has been appointed Philadelphia Rambler agent.

Mitchell, Philadelphia.—Taking the former quarters of the Hills Motor Car Company and Noblit and Fassett, at the northwest corner of Broad and Cherry, and adding to it the rear half of the Nichols Bazaar Stables, the Penn Motor Company has thrown them all into one, and after considerable alteration has one of the finest and best equipped salesrooms and garages on Philadelphia's "Gasoline Row."

Spencer Pump Distributors.—The manufacturers of the Spencer power air pump announce that the following distributing agencies have been established: American Motor Car Company, 187 Wisconsin street, Milwaukee, for the State of Wisconsin; George W. Edge, 3924 Olive street, St. Louis, for Missouri, and the Neustadt Automobile and Supply Company, 458 Golden Gate avenue, San Francisco, for that city and vicinity.

American Wind Shield in Europe.—The demand for the "Automatic" Wind Shield abroad has been sufficient to warrant C. A. Metzger, Inc., its makers, to have the shield manufactured in the leading countries of Europe. Emil Grossman, president of the National Sales Corporation, will be in charge of the wind shield exhibitions at the London and Paris shows, and will also make contracts for the manufacture of same.

Pope-Hartford, New Jersey.—The Pope-Hartford interests in Newark will hereafter be taken care of by E. P. Cooley, late of the Mitchell Automobile Company of New Jersey. Several sub-agents have already been appointed in Northern New Jersey, among them being Victor A. Wiss & Brother, of Morristown, and the Garretson Auto Company, of Somerville.

KisselKar, Chicago.—Last week negotiations were closed whereby the Middle Western territory will be handled for the KisselKar by H. P. Branstetter, of the Branstetter Motor Company, 1337 Michigan avenue. The same quarters will be used, but the name changed to the Kissel Motor Car Company. Mr. Branstetter will immediately arrange for branch agencies in his territory.

Stoddard-Dayton and Reo, Santa Rosa, Cal.—Captain O. L. Houts and D. C. Prentice, of Santa Rosa, Cal., have formed a partnership and taken the agency for the Reo and Stoddard-Dayton cars for the coming year. F. J. Wiseman, well known as a Stoddard-Dayton driver, will be associated with them in the new venture.

Twentieth Century New Selling Agency.—The Twentieth Century Manufacturing Company, makers of lamps and generators, announce that the entire selling end of the business, so far as the automobile trade goes, will hereafter be in the hands of the Stevens-Britton-Maurel Company, of 1783 Broadway, New York City.

Richmond Roadster Distributing Branches.—The Wayne Works, Richmond, Ind., manufacturers of the Richmond cars, have made arrangements with the Racine Boat Mfg. Co. to act as the agents for the Richmond Roadster at all of that company's branches, located at New York, Boston, Philadelphia, Detroit, Chicago and Seattle.

Oldsmobile, Baltimore.—The Oldsmobile will be taken care of in Baltimore for the coming year by the E. L. Leinbach Auto Company, 2312 Madison ave-



Annual Conference of Waverley Salesmen and Officers.

The regular annual conference of salesmen and officers of the Waverley department of the Pope Motor Car Company has been an annual feature of the Indianapolis factory. The most successful one ever held, however, was the recent one, where the "New" and "Old" combined in united effort to dig out all of the points regarding this well-known electric carriage, which would be to its benefit and theirs in pushing its sale. The above illustration shows the "New" and "Old" between the hours of conference. Reading from left to right, lower row: H. W. Goodman, Charles M. McAlpin, purchasing agent; Herbert H. Rice, vice-president and manager; Carl von Hake, treasurer; Wm. B. Cooley, president; Wilbur C. Johnson, secretary; Roy A. Potts, sales manager. Top row from left to right: E. K. Shugert, R. T. Davis, P. W. Wigner, K. W. Brewer, H. W. Dickerman, E. R. Vincent, W. S. Giffbreath.

nue. This company is now planning to move into more commodious quarters in the vicinity of Ninth avenue.

Jackson, New York City.—The agency for the Jackson cars in this city formerly held by the George J. Scott Company, has been taken by C. W. Oathout at the same place, 1729 Broadway. Mr. Oathout has been Eastern sales manager for the Jackson Company for a year.

Apperson, St. Louis.—Elmer Apperson, of the Apperson Brothers Automobile Company, Kokomo, Ind., who was in St. Louis recently, made arrangements with the Capen Motor Car Company to represent the Apperson in St. Louis for 1909.

Regal - Detroit, Philadelphia.—The latest newcomer to Philadelphia's big automobile family on North Broad street is the Regal-Detroit, for which the Thomas M. Twining Company, at 326 North Broad street, recently acquired the local agency.

De Luxe, New York City.—The De Luxe Motor Car Company will be represented in New York City by H. R. Mallow, who has charge of the new branch just opened on Broadway.

Continental Tires, Cleveland.—Continental tires and demountable rims will be distributed in Cleveland by Charles E. Miller, 1829 Euclid avenue.

Franklin, Grand Rapids, Mich.—Adams & Hart, of 47 North Division street, Grand Rapids, have taken the agency for the Franklin car.

Autocar, Pittsburg.—Uring & Company, of Pittsburg, has taken the agency for the Autocar as well as the Corbin.

G & J Tires, Pittsburg.—The Iron City Tire Repair Company has taken the agency for the G & J tires.

PERSONAL TRADE MENTION.

Peter S. Steenstrup is one of the latest to succumb to the allurements of matrimony, and, furthermore, he is to become a resident of Detroit, having purchased a residence at No. 75 Calvert street in that city. Mr. Steenstrup is well-known as secretary of the Hyatt Roller Bearing Company, located at Harrison, N. J., but through the necessity of spending much of his time in the Middle West, he has decided to become a resident of Detroit, where he and Mrs. Steenstrup returned recently from their transcontinental wedding tour.



Peter S. Steenstrup.

William T. Taylor ("Billie"), who is at the head of the Philadelphia branch of the Olds Motor Works, will celebrate Thanksgiving Day by banqueting all the Oldsmobile agents and subagents in his territory at the Bellevue-Stratford. As his bailiwick includes Pennsylvania, New Jersey, Delaware, Virginia and the District of Columbia, "Billie's" guests will require several large-sized tables to serve them.

H. A. Githens, who for many years has been general traveling representative of the G & J Tire Company, has been advanced to the position of general sales

manager. Mr. Githens is one of the best-known men connected with the industry, and his advancement is a just reward for conscientious services, according to the opinion of his many friends.

Emil Brossman, president of the Motor Car Equipment Company and the National Sales Corporation, sailed November 4 on the "Lusitania" to attend the Olympia show in London and the Grand Palais Salon in Paris. Mrs. Grossman accompanied him on the trip.

F. J. Lind, who is vice-president and general manager of the Maxwell-Briscoe-Pacific Company, agents for the Maxwell in San Francisco, has gone to Los Angeles, where he will take over the Maxwell interests formerly handled by the Maxwell-Briscoe-Willcox Co.

Charles M. Hall, for five years sales manager for the Badger Brass Manufacturing Co., makers of Solar lamps, at Kenosha, Wis., has resigned to become general manager of the American Lamp Co., at Detroit, Mich.

C. E. Smith, who has been with the Farmers' National Bank for a number of years, has left that institution and gone into the automobile business as the manager of the White Garage Company, Baltimore, Md.

J. H. Newmark, formerly of the Olds Motor Works, will be in charge of the newly formed publicity department of the Oakland Motor Car Company, of Pontiac, Mich.

George L. Breet, Jr., formerly with the White branch in Boston, has joined the sales department of the Algonquin Motor Company, Boston agents for the Oldsmobile.

George Fitzsimmons, formerly with the White Company in New York City, is now with H. J. Koehler in charge of the E-M-F sales department in New Jersey.

Harry De Groat has severed his connection with the Rambler Company, of Philadelphia, and in the future will be with the staff of the Studebaker Company.

M. J. O'Connor, who has been with the Pennsylvania Company in Cleveland as C. W. Moody's assistant, has gone to the Chicago branch.

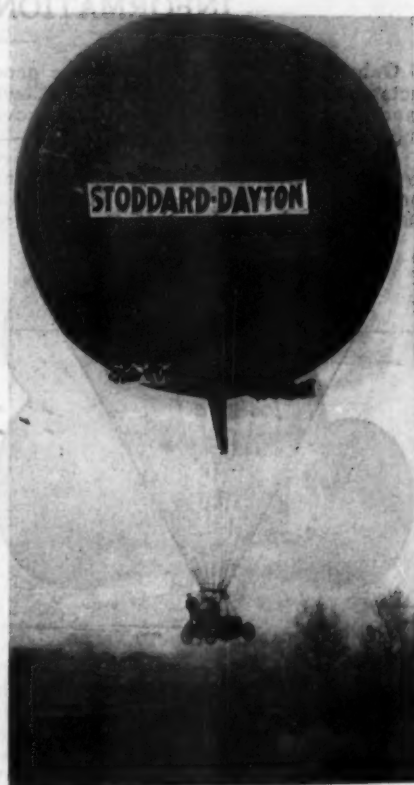
C. A. Eastman, Pacific Coast sales manager for the White, is making an extensive inspection of the territory under his control.

OVERLAND DEVELOPMENTS.

INDIANAPOLIS, IND., Nov. 2.—With the sale of the majority of the capital stock of the Marion Motor Car Company, it is announced that the manufacture of the Marion will be discontinued after this season. J. N. Willys, president of the Overland Automobile Co., and E. B. Campbell have purchased 989 out of 1,000 shares of stock in the Marion company.

The Marion plant has been placed at the disposal of the Overland company, and is being used for the manufacture of Overland engines and part of the other mechanical equipment, the assembling being done at the Overland plant, in West Indianapolis.

In line with its plans to manufacture 2,000 cars next season, the Overland company is now building a substantial addition to its West Indianapolis plant, which will be completed within the next few weeks. Edward Sourbier, for some time with the Marion Car Co., will be general manager of the Marion plant at Fifteenth street and the Big Four tracks.



Carl G. Fisher's Auto-carrying Balloon.

AN AERONAUTIC AUTOMOBILE.

Automobiling has always been closely associated with aeronautics, as the majority of enthusiasts in the latter field have been recruited from the former, but it has remained for Carl G. Fisher, of Indianapolis, to combine the two sports. Mr. Fisher, in addition to being an ardent navigator of the air, is the Indianapolis agent for the Stoddard-Dayton car, and, becoming tired of having to impress a farm wagon or other equally slow and uncomfortable method of transport to carry his party and the balloon from wherever the latter alighted, to the nearest railway station, he decided to take a car with him instead. In place of the usual basket, he substituted a Stoddard-Dayton 25-horsepower car, which was attached to the load ring of the balloon in the usual manner.

Last Friday, accompanied by Captain Brumbaugh, the well-known aeronaut, an ascension was made from Indianapolis. The plan was to make a 100-mile flight, landing just outside of Dayton, O., then load the gas bag on the deck of the automobile and proceed into the city. A westerly wind started the aeronauts in the desired direction, a few minutes after the big bag and its novel attachment were released at Indianapolis, and a landing was successfully made in a corn field near Dayton, just at dusk.

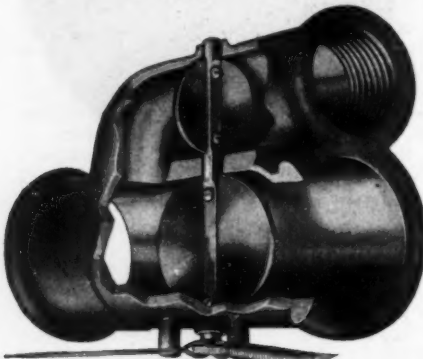


A Good Evidence of Busy Times.

INFORMATION TO AUTO USERS

Gabriel Products for 1909.—The products of the Gabriel Horn Mfg. Co., Cleveland, O., for 1909 show many improvements over former models.

As it is necessary to have a perfect working valve to operate an exhaust horn satisfactorily, the Gabriel company has perfected a valve that is guaranteed



NEW GABRIEL CUT-OUT VALVE.

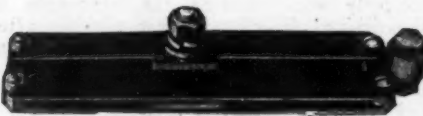
not to stick under any conditions. The instant the operating lever is moved, the disk in the main channel begins to close and the disk in the branch channel, placed at an angle of 90 degrees, starts to open. This gives immediate escape to the exhaust, causing the horn to respond, and prevents building up of back pressure. By removing the circular disk in the main channel of the valve, as shown in the illustration, a correct valve



THE 1909 GABRIEL HORN.

for the relief of the exhaust is secured; this gives a 1 1/4-inch escape opening in addition to the regular outlets; in other words, a perfect cut-out that relieves all back pressure caused by the muffler. When the valve is closed it does not allow any leaking of the exhaust or cause any noise. These valves are made up to fit all standard sizes of iron pipe or steel tubing ranging from 1 inch to 2 1/2 inches outside diameter.

While the outward appearance of the Gabriel Horn is the same as the 1908 product, the new model is superior in tone to any previous models. A little device has been perfected which makes it possible for the horn to produce a



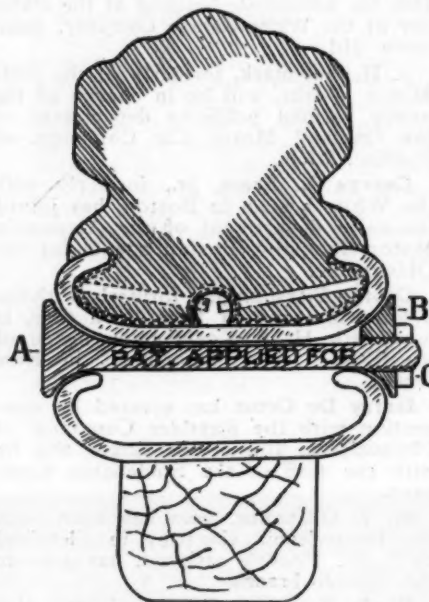
LATEST GABRIEL SHOCK ABSORBER.

sweet musical tone for city use; however, the pitch is such that the three notes can be caused to rise in unison, which makes a penetrating warning for country riding. The company will continue to furnish single-tube, three-note horns in four sizes to fit any size of motor.

The shock absorber manufactured by this company will in the new models have an increased bearing surface for attaching to the angle plate on the spring and a new method of fastening the stud

to the friction pad by use of a 1-2 by 3-4 by 2 1/4 inch case-hardened block; this gives a 5-8 inch bearing on the stud, which allows it to turn, thereby taking care of the end motion the same as side links on a spring. These two features eliminate all noise or rattle and cause the absorber to be quiet in its action, and, owing to the use of a new friction material, the effectiveness and durability of the absorber is increased.

Swinehart Rim Attachment.—This attachment permits of equipping an automobile with Swinehart cushion tires without in the least disturbing the original rim equipment or changing the road clearance of the car. Pneumatic tires can be replaced by cushion tires in less than five minutes. With this attachment one or more cushion tires can be used in connection with pneumatics, on the same car, with excellent results, as the outside diameter of the wheels is not altered. It is a well-known fact that cushion tires are necessarily somewhat



SECTION SWINEHART RIM ATTACHMENT.

less in height than pneumatics, which formerly rendered the above impossible.

Swinehart cushion tires are fitted on light clincher rims at the factory, and are then shipped to car owners, together with bolts for attaching. Eight bolts are ordinarily required for each wheel. The nuts on these bolts need not be removed, simply loosened. The bolts are all placed on top of the rim on the wheel, and the tire and rim thrown into position. The bolts are then easily slipped around to their proper position, and tightened with a wrench, which securely clamps the rim and tire to the wheel.

One of the advantages of this attachment is its utilization as a spare wheel in case of injury to one or more pneumatics. A pneumatic tire can be replaced with Swinehart spare rim and tire in less than five minutes, and it is claimed that this spare wheel will run thousands of miles without any further attention. The Swinehart company claims this to be a most practical spare equipment, as it brings the strain directly over the bearings of the wheel on the same plane as with the original tire.

A Handy Dry Cell Holder.—The R. W. Magna Mfg. Co., Holyoke, Mass., are bringing out a new dry cell holder to be known on the market as the Magna quick change rigid battery holder. Amongst the claims for this equipment are the obvious features enabling one to replace a set of cells with-



out having to cope with the annoying details of loose end wires and other well-known troubles. The illustration indicates very clearly the absence of thumb screws and other small parts, likely to loosen, thus destroying the electrical contact; if indeed, they may not be lost. The principal of the wedge is employed in holding the cells in place, incidentally affording terminal connections as a combination feature, while the wiring is by way of permanent "bus bars" within the box. The whole idea is to provide batteries in which the electrical connections will remain good when made, and in which replacements can be affected quickly and without trouble.

The "Auto-Felt Boot."—The accompanying illustration shows the type of boot which A. H. Putnam & Company, Danvers, Mass., are manufacturing especially for use by automobile users in cold weather when



THE AUTO-FELT BOOT.

difficulty is sometimes found in keeping the feet warm. It is made with a felt top, foxed with leather, has a heavy felt lining, and is ten inches in height. The sole is a heavy, one-half double leather.

Graphlio Grease.—The Walter D. Carpenter Company, 39 Cortlandt street, New York City, has just brought out a new mixture to meet the demand for a non-fluid oil for automobile use. Graphlio grease is a mixture of pure neatfoot oil of low cold test, free from stearine, and the Graphlio oil made by this company. This concern claims that the crystalline Graphlio, free from grit and dirt, in good grease, produces a mixture best fitted for all the uses of hard grease. The new preparation is furnished in five different consistencies.